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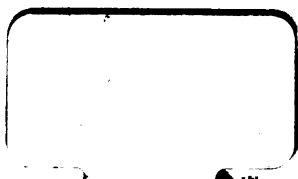
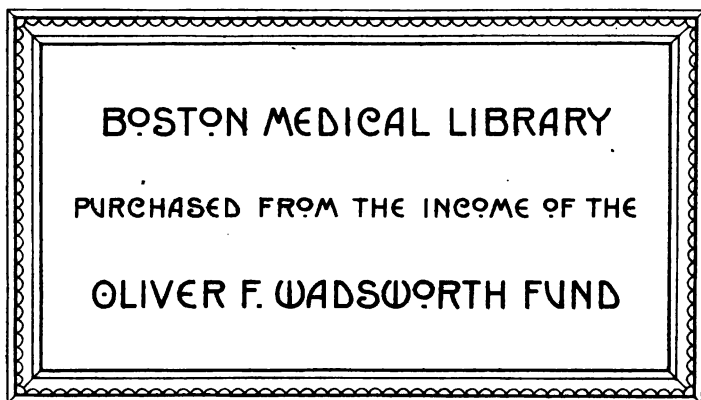


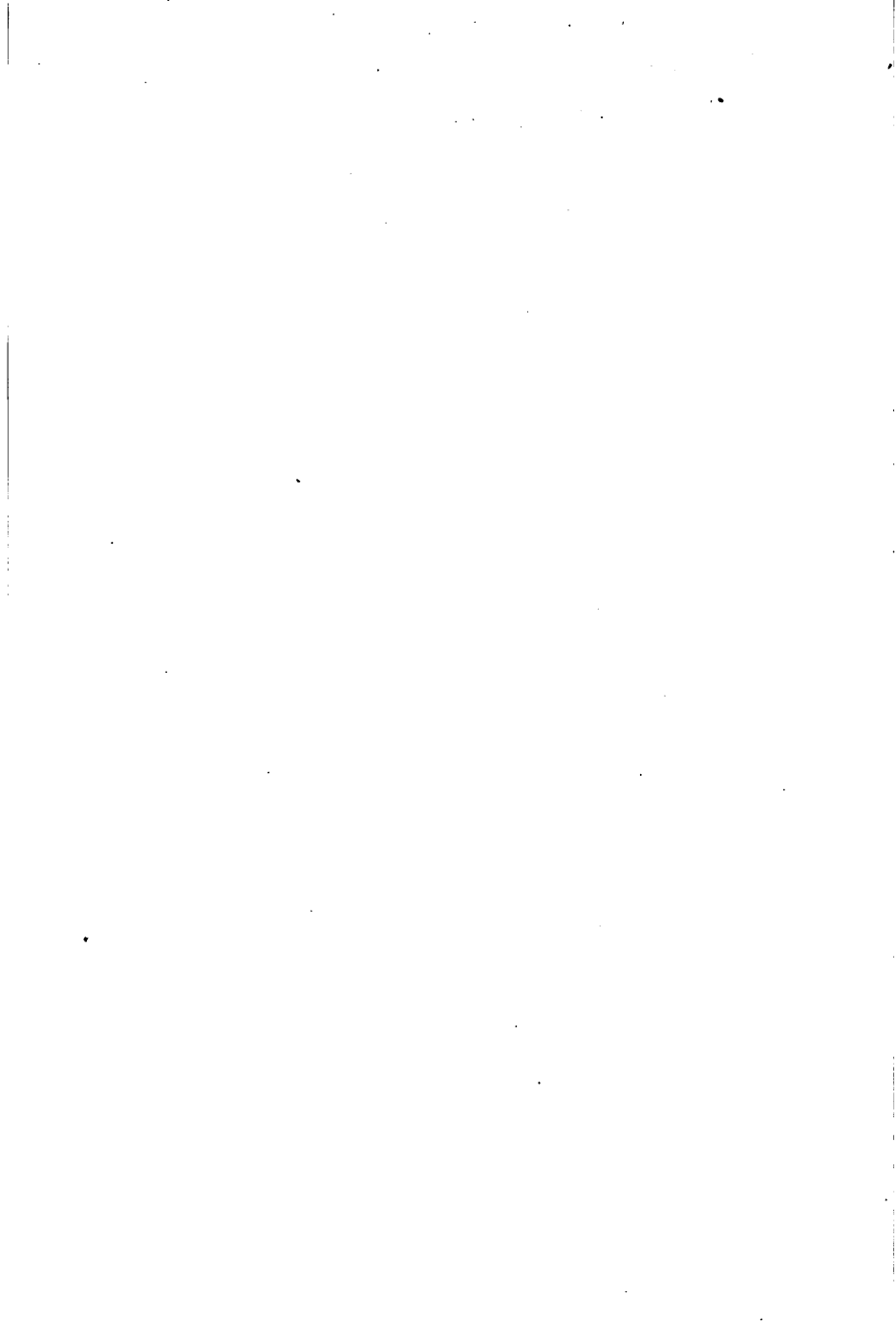
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NURSES HANDBOOK
OF
DRUGS AND SOLUTIONS

STIMSON

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NURSES HANDBOOK OF DRUGS AND SOLUTIONS

By JULIA C. STIMSON, R.N.

Vassar A.B.

Graduate of the New York Hospital Training School for Nurses

Formerly Superintendent of Nurses

Harlem Hospital

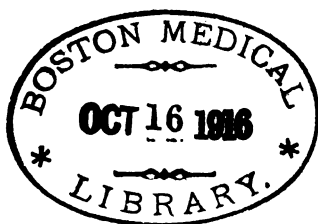
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By JULIA C. STIMSON

PREFACE

THIS book has two objects: first, to present as much *Materia Medica*, in a simple and useful form, as is essential for a nurse to know; and second, to omit as far as possible all that is not essential, albeit interesting and useful. It is not a reference book, but if mastered as a text-book it is hoped that the information it contains will enable nurses to have a sense of security and familiarity in the handling of drugs that will be of use and satisfaction to them in the practice of their profession, and also, that by its aid they will have no difficulty in preparing themselves for their examinations on the subject for State Registration.

It is recognized that the Practical Classification is open to criticism as illogical and arbitrary. But it has not been made without reason. A study of many text-books of *Materia Medica* for medical students and those for nurses has shown the great variety and the complexity of the classifications of drugs as therein presented. Some authors believe that it is impossible properly to classify drugs according to their action, as the majority of drugs have several equally important actions; therefore, they arrange the drugs alphabetically. Some classify according to the physiological action; some according to the therapeutic uses. The last arrangement is accepted by most writers as the best method. It is, however, a somewhat complicated and much subdivided method. The arrangement in these pages has worked itself out from a series of lessons based on the most common and important drugs which are administered by nurses in the wards of large general hospitals. They fall into

groups classified according to their importance and therapeutic action. It is, of course, as impossible to draw a line between the essential and the nonessential as it is to make a list of drugs arranged in sequence according to their power and importance. Such things are a matter of opinion and somewhat of locality. But a practical, easily memorized arrangement should be tried.

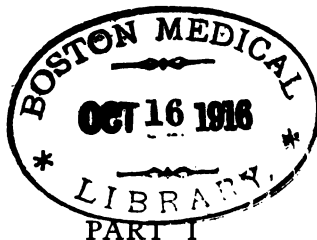
A nurse's use of *Materia Medica* is limited, and lies along different lines from the uses to which a doctor applies his knowledge of the subject, as it is beyond her province ever to prescribe. Still, it is essential that a knowledge of the powerful and important drugs be a part of her working equipment, that she may be able to afford the intelligent assistance to the physician, on behalf of the patient, that is required of her.

To make such a knowledge an easy acquirement, this book has been prepared for use as a practical handbook, as well as a classroom manual.

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DEFINITIONS, WITH EXAMPLES

Alkaloids are the organic basic substances existing in many plants, or the "active principles" of vegetable substances.

All are powerful and are given in minute doses. Their Latin names always end in in. Strychnin is one of the alkaloids of Nux Vomica, and Atropin of Belladonna.

Alteratives are remedies which alter the course of conditions, particularly in chronic diseases.

Mercury	Arsenic	Colchicum	Cod-liver Oil
Iodin	Sulphur	Phosphorus	

Analgesics or **Anodynes** are remedies which relieve pain.

Opium	Chloral	Belladonna	Atropin
Acetanilid		Phenacetin	

Local Anodynes are remedies which lessen the sensibility of the skin and mucous membrane when applied locally.

Aconite	Alcohol	Volatile Oils
Menthol	Zinc Oxid	

Anesthetics are remedies which cause temporary insensibility.

General :	Chloroform	Ether	Nitrous Oxid (Gas)
Local :	Cocain	External Cold	
	Ether	Phenol	Menthol

Antidotes are agents which prevent the action of poisons.

Antiperiodics are remedies which oppose the periodic return of symptoms.

Quinin Arsenic Iodin Salicylates

Antipyretics are agents or measures which reduce fever.

Coal-tar Antipyretics Salicylates

Quinin Aconite Baths, Sponges, etc.

Cold Drinks

Antiseptics are agents which arrest the development of bacteria.

Silver Nitrate Phenol Lysol Creolin

Pot. Iodid Alum Acetate Naphthol Quinin

Hydrogen Peroxid Potassium Permanganate

Antispasmodics are agents which arrest or cure spasms or convulsions.

Stramonium Opium Asafetida Chloral

Belladonna Valerian

Astringents are agents which produce contraction of muscular fiber and lessen discharges.

Acids Alum Lime Phenol Tannic Acid

Bismuth Silver Nitrate Zinc Sulphate

Cardiac Sedatives are agents which lessen the heart's power and energy.

Aconite Veratrum Viride Hydrocyanic Acid

Bromids Pilocarpin

Cardiac Stimulants are agents which increase the force and frequency of the pulse.

Strychnin Digitalis Adrenalin Caffein

Nitroglycerin

Carminatives are agents which expel gas from the stomach and intestines.

Asafetida	Camphor	Ether	Chloroform
Ginger	Mustard	Oil of Peppermint	

Cathartics or **Purgatives** are agents which cause intestinal evacuation.

Cerebral Depressants are agents which reduce the functions of the brain.

Bromids	Chloral	Opium	Aconite
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Most Hypnotics and Narcotics and a few Anesthetics.

Cholagogues are remedies which increase the quantity of bile secreted.

Calomel	Aloes	Podophyllum	Rhubarb
Elaterin			

Demulcents are substances which soothe and protect the parts to which they are applied.

Glycerin	Starch	Flaxseed	Gelatin	Honey
Barley	White of Egg	Olive Oil		

Diaphoretics or **Sudorifics** are remedies which produce sweat.

Alcohol	Ether	Pilocarpin	Opium
Aconite	Salicylates	Tobacco	

Disinfectants are agents which kill bacteria.

Fire Moist heat at 212° F. Dry heat at 302° F.

Bichlorid of Mercury Sol. 1 : 1000

Potassium Permanganate Sol. 1 : 100

Formaldehyd Sol. 1 : 33 Creolin Sol. 1 : 100

Lysol Sol. 1 : 100

Acetic Acid Sol. 1 : 14

Chlorid of Lime

Carbolic Acid 1 : 20

Diuretics are agents which increase the secretion of urine.

Potassium Salts, Sodium Salts, Magnesium Citrate, Alcohol, Caffein, Calomel, Convallaria, Strophanthus, Digitalis.

Ecbolics or Oxytocics are agents which produce uterine contractions.

Ergot Quinin Strychnin Oil of Rue

Emetics are agents which produce vomiting.

Alum 5-30 grs. Mustard (Sinapis) dr. 1+

Zinc Sulphate 10-30 grs. Ipecac 10-30 grs.

Tartar Emetic 1-2 grs.

Apomorphin (hypo) gr. $\frac{1}{10}$

Tepid water in quantity Salt

Emmenagogues are remedies which restore the menstrual function.

Ergot Iron Strychnin Pulsatilla Cantharis

Excitants are agents which increase the function of the brain and spinal cord.

Alcohol Ammonia Coffee Tea

Ether Strychnin Tobacco Camphor

Expectorants are agents which promote the excretion and expulsion of mucus from the bronchial membrane.

Apomorphin and other emetics Benzoin

Ammonium Chlorid and Carbonate

Strychnin Licorice Acids Sulphur

Hematinics are remedies which increase the hemoglobin of the blood

Arsenic Iron Cod-liver Oil

Hypnotics are remedies which produce sleep.

Paraldehyd	Bromids	Veronal	Trional
Opium	Hyoscin	Alcohol	Chloral

Mydriatics are remedies which cause dilatation of the pupil of the eye.

Atropin	Cocain	Hyoscyamin	Homatropin
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Myotics are remedies which cause contraction of the pupil of the eye.

Eserin	Pilocarpin	Nicotin
--------	------------	---------

Narcotics are agents which lessen sensibility.

Alcohol	Opium	Belladonna	Chloral	Phenol
---------	-------	------------	---------	--------

Respiratory Depressants are remedies which decrease the number of respirations per minute.

Opium	Aconite	Chloral	Alcohol
-------	---------	---------	---------

Respiratory Stimulants are agents which increase the number of respirations per minute.

Strychnin	Atropin	Caffein	Cold Douche
Electricity			

Rubefacients or **Counter-irritants** cause reddening and irritation of the skin when applied locally.

Capsicum	Mustard	Alcohol	Turpentin
Iodin	Cantharides		

Sedatives are agents which allay irritation, irritability and pain.

General Sedatives include narcotics and anesthetics.
Local Sedatives include local anodynes and local anesthetics.

Sialogogues are agents which increase the flow of saliva.

Ether	Mustard	Ginger	Capsicum	Pilocarpin
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Stomachics or Gastric Tonics are agents which increase the appetite and promote digestion.

Dilute alkaline solutions before meals

Arsenic Alcohol and Ether in small doses

Pepper Nux Vomica

Styptics or Hemostatics are agents which arrest bleeding.

Acids Adrenalin Alum Local heat or cold

Urinary Acidifiers are agents which make the urine acid.

Benzoic Acid Urotropin

Urinary Alkalinizers are agents which make the urine alkaline.

Potassium Salts Vegetable Diet

COMMON PREPARATIONS OF DRUGS, WITH EXAMPLES

Aqua — a solution in water of volatile substances.

Aqua Rosæ, Aqua Ammoniz, Aqua Chloroformi,
Chloroform Water

Cerate — a preparation for external use, the base of which is wax, lard or petrolatum.

Camphor Cerate

Decoction — a solution made by boiling substances in water.

Tea, Decoction of Dandelion

Elixir — a sweetened aromatic alcoholic preparation.

Elixir of Gentian, of Ferric Chlorid, of Pepsin, etc.

Emulsion — a preparation in which an oily substance is kept suspended in water by means of some viscid substance, such as yolk of egg, gum acacia, etc.

Emulsum Olei Morrhuæ, Emulsion of Cod-liver Oil

Extract — a solid preparation of a drug made by evaporating a solution of the drug.

Extractum Opii, Extract of Opium

Fluid Extract — a concentrated solution of a vegetable drug, usually a tincture, of definite strength (a minim of every fluid extract being the equivalent of a grain of the drug). Fluidextractum Ergotæ, Fluid Extract of Ergot, Fld. Ext. Nucis Vomicae, Fluid Extract of Nux Vomica.

Glycerite — a mixture of a medical substance with Glycerin.

Glyceritum Acidi Tannici, Glyc. Ferri, Iron Glycerite.

Infusion — a solution of a vegetable substance in water without boiling. Infusum Digitalis, Infusion of Digitalis. Inf. Sennæ Compositæ, Compound Senna Infusion.

Liniment — an oily liquid preparation to be rubbed upon the skin.

Linimentum Camphoræ, Camphor Liniment. Chloroform and Belladonna Liniment, etc.

Liquor — a solution in water of a non-volatile substance. Liquor Calcis, Lime Water, Liq. Potasii Citratis, Solution of Potassium Citrate.

Mixture — a preparation in which two or more liquids are mixed together. *Mistura Rhei et Sodii*, *Rhubarb and Soda Mixture*, *Mistura Glycyrrhizæ Compositæ*, *Compound Licorice Mixture* (*Brown Mixture*).

Ointment (*Unguentum*) — a mixture of a medical agent in a basis of lard or *petrolatum*. *Ung. Acidi Borici* or *Boric Acid Ointment*, *Ung. Hydrargyri* or *Mercurial Ointment*.

Spirit — an alcoholic solution of a volatile substance. *Spiritus Ætheris Nitrosi* or *Spirits of Nitrous Ether*. *Sp. Frumenti* (*Whisky*), *Sp. Ammoniaë* or *Spirits of Ammonia*.

Suppository — a solid body containing a medical substance for insertion in the vagina, rectum or urethra. *Suppositoria Glycerini*, *Glycerin Suppositories*, *Opium* or *Belladonna Suppositories*, etc.

Tincture — an alcoholic solution of a non-volatile medicinal substance (with the exception of *Tr. of Iodin*, for *Iodin* is volatile). *Tinctura Aconiti*, *Opii*, or *Tincture of Aconite*, *Opium*, etc., *Tr. Nuc. Vom.* or *Tincture of Nux Vomica*.

Wine — a tincture with white wine as a base. *Vinum Ferri* or *Wine of Iron*, *Vinum Colchici Seminis* or *Wine of Colchicum Seed*.

COMMONEST METHODS OF APPLYING DRUGS

I. To the Skin

Inunctions (*Oils*, *Liniments*, *Ointments*, etc.)

Contact without rubbing (Baths, Blisters, Cooling Applications, etc.)

2. To the Mucous Membrane
(Gargles, Sprays, Douches, etc.)
3. To Wounds and Diseased Tissues
(Antiseptic Powders, Ointments, Solutions, etc.)
4. To the Respiratory Tract
Inhalation of fumes or vapors
5. To the Circulatory System
Hypodermic Injection
Intravenous Infusion
Hypodermoclysis
6. To the Alimentary Canal
By Mouth (Pills, Powders, Solutions, etc.)
By Rectum (Enemata, Suppositories, etc.)

CONSIDERATIONS FOR THE MODIFICATION OF DOSAGE

Age. Rule for calculating the dose for a child when the adult dose only is known.

Take the age (in years) of the child as the numerator and the age plus twelve for the denominator. The resulting fraction will be that part of the adult dose to be given. (Example: Age 3 years,

$\frac{3}{3 + 12} = \frac{3}{15}$ or $\frac{1}{5}$, which is part of adult dose to be given.)

Weight. Heavy, muscular persons require larger doses, as a rule, than those who are delicate.

Sex. The dose for a woman is usually smaller than that for a man.

Idiosyncrasy. Certain individuals have a peculiarity of constitution whereby they are affected by a drug or agent in a manner entirely different from the ordinary.

Acquired Immunity. The injection of certain toxins or drugs in gradually increasing doses at proper intervals can often be borne without reaction.

Physical Condition. In illness the dose is increased according to the severity of the disease or the urgency of the case. Thus very large doses of Morphin are tolerated in severe pain, because the action of the drug is spent in overcoming the pain. In cases of great shock larger doses of stimulants are given than would be required in conditions of slight shock. Pregnancy, menstruation and lactation modify the doses of some drugs.

Accumulative Action. Some drugs are excreted from the body so slowly that the whole of one dose is not excreted before the next dose is given, consequently the amount present in the body gradually increases. (Examples: Arsenic or Digitalis.)

Habituation. Larger doses than usual are often necessary if the individual has become accustomed to any drug taken for a protracted time.

Method of Administration. One dose by hypodermic equals, approximately, two doses by mouth and four by rectum.

PART II

WEIGHTS, MEASURES AND SOLUTIONS

Apothecaries' or Troy Weight

Gr.xx, or 20 gr. = 1 scruple (℥)

℥iii, or 3 sc. = 1 drachm (℥)

Gr.lx, or 60 gr. = 1 drachm (℥)

℥viii, or 8 dr. = 1 ounce (℥)

℥xii, or 12 oz. = 1 pound (lb)

Apothecaries' or Wine Measure

m.lx, or 60 minims = 1 fluidrachm

℥viii, or 8 fldr. = 1 fluidounce

℥xvi, or 16 floz. = 1 pint

℥xxxii, or 32 floz. = 1 quart

Metric System

Unit of Weight = 1 gramme

Unit of Length = 1 metre (39+ inches)

Unit of Volume = 1 cubic centimetre (c.c.)

1 c.c. of water weighs 1 gramme (at 4° C.)

Volume

1 c.c. = 1 gm. of water in weight

1000 c.c. = 1000 gms. of water

(or 1 litre = 1 kilo (kilogramme) in weight)

= lb. 2.7 Troy, or lb. 2.2 Av.

Weight

1 gramme or Unit of Weight

1000 grammes = kilo

Length

1 metre or Unit of Length

1000 meters = 1 kilometer

Approximate Equivalents

15 grains = 1 gramme

15 grains = 1 c.c.

15 minims = 1 c.c.

1 grain is equivalent to 1 minim

4 grammes = 1 fldr.

4 c.c. = 1 fldr.

30 c.c. = 1 ounce (32 actually)

1000 c.c. = 1 litre or quart

1 fldr. = 1 teaspoonful, or 4 c.c., or 4 grammes in weight

2 fldr. = 1 dessertspoonful, or 8 c.c., or 8 grammes in weight

8 fldr. = 2 tablespoonfuls, or 30+ c.c., or 30+ grammes in weight

2 floz. = 1 wineglassful, or 60+ c.c., or 60+ grammes in weight

4 floz. = 1 teacupful, or 120+ c.c., or 120+ grammes in weight

8 floz. = 1 glassful (filled to brim), or 240+ c.c., or 240+ grammes in weight

Note I. 1 : 1000 solution always means 15 grains to the quart ($\frac{1}{16}\%$).**Note II.** 1 : 100 or 1% solution always means 5 grains (or 5 minims) to the ounce. (Literally 4.8 grains.)

Normal Saline Solution ($\frac{1}{10}$ of 1%)

90 grains of salt to the quart (Note I)

6 grammes (by weight) to the quart

 $1\frac{1}{2}$ drachms or a rounded teaspoonful to the quartFor a $\frac{1}{10}$ of 1% solution use 135 grains to the quart, or approximately a drachm to a pint (70—grs.)**Brief Solution Table**

(Using 5 grains to the ounce for a 1% solution or Note II)

For 1 : 1000 use dr.i to a gal., or mxv to 1 qt. ($\frac{1}{10}$ %)

1 : 100 use dr.ii, mxl to 1 qt.

1 : 100 use dr.i, mxx to 1 pt.

1 : 50 use dr.v, mxx to 1 qt.

1 : 50 use dr.ii, mxl to 1 pt.

1 : 25 use dr.v, mxx to 1 pt.

1 : 20 use dr.xiii, mxx to 1 qt.

 $\frac{1}{10}$ of 1%, or $\frac{1}{10}$ % = 1 : 1000 $\frac{1}{5}$ of 1%, or $\frac{1}{5}$ % = 1 : 500 $\frac{1}{2}$ of 1%, or $\frac{1}{2}$ % = 1 : 200

1% = 1 : 100

2% = 2 : 100 or 1 : 50

3% = 3 : 100 or 1 : $33\frac{1}{3}$

4% = 4 : 100 or 1 : 25

5% = 5 : 100 or 1 : 20

10% = 10 : 100 or 1 : 10

20% = 20 : 100 or 1 : 5

25% = 25 : 100 or 1 : 4

50% = 50 : 100 or 1 : 2

100% = 100 : 100 or 1 : 1 (a pure drug)

Rules for Solutions

Rule I. To make a weaker from a stronger solution.

Divide the strength desired (or the weaker solution) by the strength you have (or the stronger solution), and then divide the amount wanted by the first result.

First be sure that the two strengths you are working with are in the same terms. For instance, if one strength is in % (per cent) and the other in proportion, as 1 : 20 or 1 : 1000, change the per cent to proportion. (See table, page 13.)

Examples

I. Given a 5% (or 1 : 20) solution of Carbolic Acid to make 3 quarts of a $\frac{1}{2}$ % (or 1 : 200) solution. (Rule I.)

$$\begin{array}{r} 20 \overline{) 200} \\ 10 \end{array}$$

$$3 \text{ qts.} \div 10 = 96 \text{ oz.} \div 10 = 9\frac{6}{10} \text{ oz.}$$

$$\frac{6}{10} \text{ oz.} \times 8 = 4\frac{4}{5} \text{ drs.} \quad \frac{4}{5} \text{ dr.} \times 60 = 48 \text{ m.}$$

Ans. $\text{℥ix, ℥iv, m.xlviii.}$

II. Given a 2% Silver Nitrate solution to make 1 gallon of a 1 : 4000 solution. (Rule I.)

$$2\% = 1 : 50 \qquad \begin{array}{r} 50 \overline{) 4000} \\ 80 \end{array}$$

$$1 \text{ gal.} = 4 \text{ qts.} = 128 \text{ oz.} = 1024 \text{ drs.}$$

$$80 \overline{) 1024} (12 \text{ drs.} (= \text{℥i, ℥iv})$$

$$\begin{array}{r} 80 \\ \hline 224 \\ \hline 160 \\ \hline 64 \\ \hline 80 \end{array}$$

$$\frac{64}{80} \times 60 = 48 \text{ m.}$$

Ans. $\text{℥i, ℥iv, m.xlviii.}$

III. Given some pure drug. (Rule I.) (A pure drug equals 100% or 1 : 1.) For instance:

To make 2 quarts of a 1% solution of Acetic Acid.

1% = 1 part of Acetic Acid to 100 parts of water.

$$2 \text{ qts.} = 64 \text{ oz.} = 512 \text{ drs.}$$

Since there is to be 1 part of Acetic Acid to every 100 parts of water, we must give as many drachms of Acetic Acid as there are hundreds in 512 drachms, which is $5\frac{12}{100}$ drachms.

$$\frac{12}{100} \times 60 = 7 \text{ m.}$$

Ans. Use $\mathfrak{z}\text{v}$, m.vii of Acetic Acid for 2 qts.
of 1% solution.

Another way of working out this problem is to use Note II.

5 grs. to the oz. is a 1% solution.

$$2 \text{ qts.} = 64 \text{ oz.}$$

$64 \times 5 \text{ grs.} = 320 \text{ grs.}$, or the amount
necessary for 2 qts.

$$320 \text{ grs.} = 5 \text{ drs. and } 20 \text{ m.}$$

(Divide by 60.)

(The difference in the minims in the two methods is due to the fact that 5 grains to the ounce for a 1% solution is an approximate figure. Actually it should be 4.8 grains, but 5 grains is close enough for all practical purposes.)

IV. Given a bottle of 95% Carbolic Acid. (Rule I.)
(A pure drug equals 100% or 1 : 1.)

(95% Carbolic Acid is considered Pure Carbolic because 5% water or glycerin is used to keep it in solution.)

To make 3 pts. of a 5% solution.

$$5\% = 5 : 100 \text{ or } 1 : 20.$$

$$3 \text{ pts.} = 48 \text{ oz.}$$

Since there is to be 1 part of Carbolic to every 20 parts of water we must use as many ounces of Carbolic as there are twenties in 48 ounces, which is $2\frac{8}{10}$ ounces.

$$\frac{8}{10} = \frac{2}{5} \times 8 \text{ drs.} = \frac{16}{5} = 3\frac{1}{5} \text{ drs.}$$

$$\frac{1}{5} \times 60 \text{ m.} = 12 \text{ m.}$$

Ans. $\mathfrak{Z}\text{ii}, \mathfrak{Z}\text{iii}, \text{m.xii.}$

This problem can also be solved by the second method used in Example III, using Note II.

For 1 ounce of a 1% solution we will need 5 grains.

For 1 ounce of a 5% solution we will need 25 grains.

For 3 pints or 48 ounces we will need 48 times 25, or 1200 grains or minims, which, divided by 60, equals 20 drachms.

$$20 \text{ drs.} = 2 \text{ oz. and } 4 \text{ drs.}$$

Rule II. To estimate a dose of a different fractional part of a grain from the drug on hand.

Multiply the denominator of the fraction of the solution on hand by the number of minims containing it, and divide the result by the denominator of the fraction required.

Examples

V. If $\text{m.x} = \text{gr. } \frac{1}{80}$, how would you give $\text{gr. } \frac{1}{75}$?

If $\text{m.x} = \text{gr. } \frac{1}{80}$, m.i will contain $\frac{1}{10}$ of $\frac{1}{80}$ or $\frac{1}{800}$ of a grain. It will then take 300 minims to contain 1 grain. It follows then that if m. 300 contains 1 grain, $\frac{1}{75}$ of a grain will be contained in $\frac{1}{75}$ of 300, or 4 minims.

$$\text{Ans. } \text{m.iv} = \text{gr. } \frac{1}{75}.$$

VI. If $m.x = \text{gr. } \frac{1}{80}$, to give $\text{gr. } \frac{1}{200}$. (Rule II.)

$$\begin{array}{r} 200)300(1\frac{1}{2} \\ \underline{200} \\ 100 \\ \underline{200} \end{array}$$

Ans. $m.\text{iss} = \text{gr. } \frac{1}{200}$.

How to give a fraction of a minim.

Double the dose, add an equal amount of sterile water, then give half of that whole amount.

To give $m.\text{iss}$ take $m.\text{iii}$, add $m.\text{iii}$ of sterile water and of this 6 minims give 3 minims ($m.\text{iii}$).

VII. From a bottle of 15 grain tablets of Bichlorid of Mercury how would you make 4 quarts of a 1 : 10000 solution?

15 grs. to 1 qt. is a 1 : 1000 solution (Note I).

4×15 grs. or 60 grs. to 4 qts. is still a 1 : 1000 solution.

1 : 10000 is 10 times weaker than a 1 : 1000 solution, therefore we need, for 4 qts. of a 1 : 10000 solution, $\frac{1}{10}$ of 60 grs. or 6 grs.

The tablets are 15 grains. To obtain 6 grains, dissolve 1 tablet in 1 drachm of water and take $\frac{6}{15}$ of the drachm, or $\frac{6}{15}$ of 60 minims, which equals 24 minims.

If you have a capsule or tablet containing a larger dose than the dose ordered. Dissolve it in water and give the required fraction of the solution.

For instance : Given a capsule containing 5 grains of Soda Bicarb. to give 2 grains. Dissolve in water and give $\frac{2}{5}$ of the solution.

VIII. Given a solution of Camphor in Oil 20%, to give 5 grains.

20% = 20 : 100 or 1 : 5 or 1 gr. in 5 minims.

Therefore to give 5 grains take 25 minims.

SOLUTIONS, Continued

Lysol—A preparation of Carbolic Acid.

Used in 1 : 200 to 1 : 50 solutions for vaginal antiseptis.

Lime Water—Gastric sedative.

Prepared by dissolving unslaked lime in sterile water. Use $\frac{1}{4}$ lb. to 1 qt. of water. Allow to stand for a few hours, then filter. Keep in a cool place, well corked.

Chlorid of Lime Solution—For disinfecting evacuations.

Use 1 lb. to 1 gal. of cold water. Mix in a wooden pail.

Potassium Permanganate—Antiseptic irrigations and for stomach washings.

Used in 1 : 500 to 1 : 5000 solutions for irrigations and stomach wash, and in 1 : 50 to 1 : 1000 solutions for gargles, sprays, etc.

Aluminum Acetate—For antiseptic dressings and infected wounds, etc.,

Acetate of Lead 38 grs.

Alum 24 grs.

Water 1 qt.

Formalin—A solution of formaldehyd gas in water.

Usually 40%.

Used in a 1 : 50 solution for disinfecting wounds and instruments, in a 1 : 25 solution for disinfecting stools and a 1 : 400 solution for irrigating purposes.

For Fumigation.

Sufficient formaldehyd gas will be generated for 1000 cubic feet of air space by pouring over 6½ oz. of potassium permanganate crystals, 1 pint of formalin (40%).

Peroxid of Hydrogen—For cleaning pus cavities and necrotic tissue. Oxygen is liberated and pus is destroyed.

For pus cavities use pure.

For gargle dilute ½–¼.

Keep in a cool place.

Bichlorid of Mercury—Efficient disinfectant, except for instruments, which it corrodes; white goods, which it discolors; and feces and sputum, which it does not disinfect on account of the albuminous material and ammonia usually present in excreta, which decompose the drug.

Used in a 1 : 5000 solution for many antiseptic purposes and in a 1 : 1000 for disinfecting.

Carbolic Acid or Phenol—Antiseptic and disinfectant.

Pure Carbolic requires about 5% of water or glycerin to keep it in solution. In making solutions hot water must be used, and the bottle must be

shaken until all globules disappear, as they will burn any tissue with which they come in contact.

Used in a 1 : 20 solution for disinfecting instruments, clothing, utensils and excreta and in a 1 : 100 or 200 solution for antiseptic dressings.

Boracic Acid or Boric Acid

Saturated solution is 4%.

Antiseptic and soothing in dilute solutions.

Used in 1 : 50 solutions for eye and ear irrigations.

Carron Oil or Lime Liniment.—Equal volumes of lime water and linseed oil.

For local use, particularly for burns.

PART III

PRACTICAL CLASSIFICATION OF DRUGS

* Drugs upon which emphasis has been laid.

I. Heart Stimulants

a. Artery Constrictors

*Strychnin	*Adrenalin	
*Digitalis	*Caffein	Camphor

b. Artery Dilators

*Nitroglycerin	Sodium Nitrite
*Amyl Nitrite	Sweet Spirits of Nitre

II. Heart Depressants

*Aconite	Colchicum
*Veratrum Viride	

III. Narcotics and Hypnotics

a. Hydrocarbon Narcotics

*Alcohol	Alcoholic Beverages
*Ether	Nitrous Ether
*Chloroform	Hoffman's Anodyne

b. *Opium Group

Opium	Paregoric
Morphin	Codein
Laudanum	Heroin

c. Hypnotics

*Chloral	Veronal
Chloralamid	Paraldehyd
Sulphonal	Hedonal
Trional	Amylene Hydrate

d. Alkaloidal Hypnotics

Hyoscin

Morphin

IV. Respiratory Stimulants

*Atropin Hyoscyamus

Strychnin Stramonium

*Hyoscin

V. Motor and Respiratory Depressants

*Eserin Bromids

VI. Coal-Tar Products

a. Antipyretics

Acetanilid Aspirin

Ammonal Migranin

Antikamnia Phenacetin

Antipyrin

b. Antiseptics

Benzoin Phenol-camphor

*Carbolic Acid Picric Acid

Creosote Lysol

Creolin *Salicylic Acid

Guaiacol Salol

VII. Diuretics and Diaphoretics

*Scoparius Pot. Citrate A. B. C. Diuretic

*Pilocarpin Pot. and Sodium Tartrate

Squill Seidlitz Powder Senega

Pot. Acetate Apocynum Urotropin

Caffein

VIII. Cathartics

a. Laxatives and Aperients*b.* Simple Purgatives

- c.* Drastic Purgatives
- d.* Cholagogue Purgatives
- e.* Saline Purgatives

IX. Alteratives

- *Arsenic Calcium Chlorid
- *Iron Sodium Phosphate
- *Iodin Urotropin

X. Metals

- | | | | |
|--------|-----------|----------|---------|
| Alum | Antimony | Arsenic | Bismuth |
| Cerium | Copper | Gold | Iron |
| Lead | Manganese | *Mercury | Silver |
| Zinc | | | |

XI. Intestinal Antiseptics

- Salol Urotropin
- Salicylates Creosote

XII. Intestinal Astringents

- | | | |
|--------------------|------|--------------------|
| Bismuth Subnitrate | Iron | Silver Nitrate |
| Alum | | Bismuth Subgallate |
| Opium | | Tannic Acid |

XIII. Antispasmodics

- Asafetida
- Valerian

XIV. Acids

- Acetic
- Hydrochloric
- Hydrocyanic
- Nitric
- Sulphuric
- Tannic

PRACTICAL CLASSIFICATION OF DRUGS

I. Heart Stimulants

a. Artery Constrictors.

Strychnin (Nux Vomica)

Source: Strong alkaloid from the East Indian plant, Nux Vomica.

Action: Cardiac, Respiratory, Spinal and Cerebral Stimulant. Stomachic.

Externally and locally poisons vermin. In the mouth has bitter taste. Increases flow of saliva and of gastric juices (bitter tonic effect). Promotes peristalsis and increases appetite. Has no *direct* action on the heart and respiratory system, but acts through the nervous system, which it stimulates. Contracts and tones arteries and veins. Raises blood pressure. Increases respiration. Steadies and holds heart in check. Lowers pulse. Has accumulative effect.

Preparations and Dosage:

Strychnin Sulphate or Nitrate, dose, gr. $\frac{1}{100}$ to $\frac{1}{80}$

Extract of Nux Vomica, dose, gr. $\frac{1}{8}$ to i

Fluid Extract of Nux Vomica, dose, m.i to iii

Fluid Extract contains 1% Strychnin

Tincture of Nux Vomica, dose, m.v to xx

Tincture of Nux Vomica contains $\frac{1}{10}$ % Strychnin

Wine of Nux Vomica, dose, oz. $\frac{1}{2}$

Symptoms of Overdosage :

Overexcitation of nervous system. Restlessness and twitching. Convulsions, with relaxation between spasms, which may be brought on by the slightest touch or sound, owing to the intense irritability of the nervous system. Rigidity. Opisthotonos. Staring eyes. "Risus Sardonius," or sardonic grin. Mind usually clear. Death due to paralysis of respiratory muscles.

Antidotes and Treatment :

Emetics (Zinc Sulphate). Lavage (Potassium Permanganate). Tannic Acid. Chloroform to control convulsions. Amyl Nitrite inhalations. Chloral and Sodium Bromid by rectum. Catheterization. Quiet.

When giving Strychnin in any form restlessness and twitching are always to be watched for. Strychnin is more effectual in old people.

One of the differences between Strychnin and Tetanus convulsions is that in Strychnin poisoning the jaw is one of the last parts to be affected.

Digitalis

Source : The Purple Foxglove.

Action : Cardiac Stimulant, Gastrointestinal Irritant and Diuretic.

Is a sharp irritant subcutaneously. Has a direct action on the heart muscle. Stimulates contractility. Increases force and lowers rate of pulse. Stimulates and contracts blood vessels. Has a

powerful checking influence on the heart. Increases the amount of urine excreted. Has accumulative effect.

Preparation and Dosage :

Extract of Digitalis, dose, gr. $\frac{1}{4}$ to i

Fluid Extract of Digitalis, dose, m.i to m.iii

Tincture of Digitalis, dose, m.v to m.xxx

Infusion of Digitalis, dose, dr.i to iv

Symptoms of Overdosage :

Slow pulse, becoming rapid. Violent vomiting. Vertigo and pain. Dilated pupils and staring eyes. Diarrhea. Irregular, weak pulse. Rapid, feeble respiration. Delirium, stupor and convulsions. Final paralysis of heart.

Antidote and Treatment :

Emetics and cathartics. Tannin in large quantities. Rest and quiet in a horizontal position. Ammonia, Brandy, Strychnin and Atropin for stimulation.

Digitalis is bitter, nauseating and may interfere with digestion. May also cause sleeplessness and fainting.

Adrenalin

Source : The Suprarenal Glands of sheep.

Action : Cardiac Stimulant, Vasoconstrictor and Hemostatic. Is alkaloidal in character. Stops local bleeding and checks secretions. Contracts arteries. Increases the force and decreases the rate of pulse. Raises blood pressure. Increases

arterial tone and stimulates the heart. The most powerful hemostatic and astringent known and a stimulant of great energy. An ideal stimulant for rapid action in shock, collapse and cardiac failure.

Preparation and Dosage :

Adrenalin Chlorid (1 : 1000 solution), dose, m.v to xx

Suprarenal Extract, dose, gr. v (by mouth)

Caffein

Source : Coffee berries and tea leaves.

Action : Cardiac Stimulant, Cerebral Excitant and Diuretic.

Stimulates intestinal tract slightly. Stimulates heart and nerves directly. Increases thought action and acute sensations. Diminishes fatigue. Stimulates kidney cells.

Preparation and Dosage :

Caffein Citrate, dose, gr.i to v

Caffein Hydrobromate, dose, gr. $\frac{1}{2}$ to ii

Caffein and Sodium Benzoate, dose, gr.ii to x

Caffein and Sodium Salicylate, dose, gr.ii to x

Symptoms of Overdosage :

Caffein in toxic doses produces headache, restlessness, insomnia, giddiness, profuse urination, colic, rapid, feeble pulse and collapse.

Antidote and Treatment :

Empty stomach, give Tannic Acid and Aromatic Spirits of Ammonia for stimulation.

Camphor

Heart Stimulant, Stomachic and Carminative, Diaphoretic and Expectorant.

Aqua, dose, oz. $\frac{1}{2}$ to i

Spirits, dose, m.xv to xxx

Camphora Monobromata, dose, gr.ii to x

I. Heart Stimulants, Continued**b. Artery Dilators.****Nitroglycerin**

Source : Made from Glycerin and a mixture of Sulphuric and Nitric Acid, by washing and evaporation.

Action : Cardiac Stimulant, Vasodilator.

Reduces blood pressure by dilating arteries and veins. Increases pulse rate. Powerful depressant to motor centers. Flushes skin. Increases respiration and amount of urine voided. No external or local effect. No direct effect on stomach or heart.

Preparation and Dosage :

Nitroglycerin, dose, gr. $\frac{1}{100}$ to $\frac{1}{50}$

Spirits of Glonoin (1% solution in alcohol), dose, m.i to iv

Symptoms of Overdosage :

Perspiration. Flushed skin. Violent headache. Occasional nausea. Throbbing arteries. Dilated pupils. Intense pain in head. Slow, irregular pulse.

Amyl Nitrite

Action : Cardiac Stimulant, Vasodilator, Antispasmodic.

Quicker effect than Nitroglycerin. Dilates arteries immediately. Increases pulse rate. Depresses motor centers. Acts as a heart stimulant. Vapor enters the blood through the lungs with great rapidity and reaches the tissues almost immediately. The muscle walls of the arteries are paralyzed and the vessels dilate. Blood pressure falls, with consequent relief to the heart, which has less work to do and the same or more strength to do it with. Excreted by the kidneys.

Preparation and Dosage :

Pearls for inhalation (3 to 5 drops)

Symptoms of Overdosage :

Fullness and throbbing of vessels. Flushing. Dilated pupils. Deep, labored respiration. Anxiety and restlessness. More severe symptoms are grave depression, with cold extremities. Slow, almost imperceptible pulse. Persistent headache. Possible convulsions and paralysis of heart and nerve centers.

Antidote and Treatment :

Artificial respiration, Strychnin and Atropin.

Sodium Nitrite, dose, gr.ii to v. Slower and more prolonged action than Nitroglycerin.

Sweet Spirits of Nitre (Spiritus Ætheris Nitrosi), dose, dr. $\frac{1}{2}$ to ii. Stimulant, with mild diuretic, diaphoretic, antipyretic and sedative powers.

II. Heart Depressants

Aconite

Source: Root of European plant called Monks-hood or Wolfsbane. Chief constituent "Aconitin," the most powerful alkaloid known (gr. $\frac{1}{20}$ fatal), dose, gr. $\frac{1}{400}$.

Action: Cardiac and Respiratory Sedative, Antipyretic, Diuretic.

Dilates arteries and decreases pressure in febrile conditions. Externally and locally slightly absorbed. Parasiticide. Analgesic. Paralyzes nerves locally, causing tingling and numbness. Irritant to stomach and causes vomiting. Powerful cardiac poison. Reduces frequency, force and tension. Produces a gentle perspiration and increases flow of urine. Respirations become slower and deeper and temperature falls.

Preparation and Dosage:

Fluid Extract, m.i to ii

Tincture, m.i to iv (old 35% solution)

Tincture, m.i to xv (new 10% solution)

Symptoms of Overdosage:

Tingling in mouth and skin. Constricted feeling in throat. Tongue and breath are cold. Disorders of vision. Staring eyes. Respiration diminished, and pulse may fall to 30 or 40 a minute. Great muscular weakness. Irregular pulse. Suppressed voice. Mind usually clear, except in cases of con-

vulsions. Death may occur from paralysis of heart muscles or respiratory center.

Antidote and Treatment :

Emetics and lavage. Alcoholic stimulants. External heat. Absolute quiet and rest and artificial respiration. Head low. Cardiac stimulants. Atropin and Ammonia.

Precautions: Pulse, respiration and temperature to be carefully watched. Guard against cold air and drafts. Allow no exertion on the part of patient.

Veratrum Viride

Source: The roots of Hellebore, an American and European plant.

Action: General Depressant.

Cardiac Depressant and Spinal Paralyzant. Reduces pulse in strength and frequency; lowering the pulse to 35 or 40. Exertion may make it rapid, thready, small and weak from being moderately full and soft. Direct influence on heart muscles, causing a depressing action and muscular weakness. Brain not affected. Used in Eclampsia, though lacking power over excretion. Affects respirations less than Aconite; paralyzes motor system centrally; unaffacting sensation, but impairing reflexes. Emetic and Cathartic.

Preparation and Dosage :

Fluid Extract, dose, m.i to iii

Tincture, dose, m.x to xxx (10%)

Norwood's Tincture, dose, m.v, increasing (44%)

Symptoms of Overdosage :

Nausea and vomiting. Cold, clammy skin and threadlike pulse. Rarely fatal results, though symptoms are alarming, including faintness, loss of sight and partial loss of consciousness.

Antidote and Treatment :

Emetics and lavage. No exertion. Elevation of feet. Perfect rest. Alcoholic stimulants. External heat.

Pulse should not be allowed to fall below 70. Many incidental effects: dizziness, choking, dryness of mouth, etc.

Colchicum

Meadow Saffron (roots or seed).

Action: Cardio-Respiratory Depressant and Irritant. Emetic, diuretic and diaphoretic, drastic purgative, gastrointestinal irritant and cardiac depressant. Sedative to central nervous system. Used in gout. Pulse slightly reduced in frequency. Stimulates the liver.

Preparation and Dosage :

Wine of Colchicum Seed, dose, m.xv to xxx

Wine of Colchicum Root, dose, m.v to xx

Fluid Extract of Colchicum Seed, dose, m.iii to x

Fluid Extract of Colchicum Root, dose, m.ii to viii

III. Narcotics**a. Hydrocarbon Narcotics.**

Alcohol (Narcotic in large doses)

Source : Made by a process of fermentation from substances containing grape sugar, also by chemical process and distillation.

Action : Cerebrospinal Excitant, Cardiac and Gastric Stimulant, Antipyretic.

Externally and locally a fat solvent, cleans the skin, hardens it and slightly stimulates. Irritant and local anesthetic. Relieves pain and has cooling effect (due to evaporation). Antiseptic. Deadens nerve terminals. In the mouth an irritant; biting and semi-antiseptic. In the stomach an irritant, increasing the secretions; hence, in small doses, increasing digestion and absorption. Slightly depressant to heart. Increases force and frequency of pulse; causes sweating and heat loss. Marked effect on nervous system; deadens control of mind and moral sense; dulls the intellect and muscular control. Four stages: 1. Excitement. 2. Depression. 3. Paralysis. 4. Recovery. It is excreted by the lungs and kidneys. Alcohol in fevers reduces temperature by increasing perspiration.

Dose, oz. $\frac{1}{2}$.

Alcoholic Preparations and Beverages

Absolute Alcohol contains 1% water.

Brandy (*Spiritus Vini Gallici*) is obtained from grape wine and contains about 45% alcohol.

Whisky (*Spiritus Frumenti*) is obtained from certain

grains, as rye, corn and wheat, by distillation and contains about 45% alcohol.

Rum is obtained by the distillation of molasses and contains about 42% alcohol.

Gin is grain spirits distilled with Juniper berries and contains about 45% alcohol.

Red Wine (Vinum Rubrum) is obtained from the entire grape and contains 7-12% alcohol. Examples: Claret, Bordeaux and Port.

White Wine (Vinum Album) is obtained from the juice of grapes and contains 7-12% alcohol. Examples: Sherry, Madeira and Catawba.

Champagne is a carbonated wine and contains 10-13% alcohol.

Ale or Stout is obtained from barley and hops and contains 5-9% alcohol.

Beer or Porter is also obtained from barley and hops and contains 2-5% alcohol.

Kumyss, a fermented milk preparation, contains 1-3% alcohol.

Ether

Source: A highly volatile liquid obtained by the action of strong sulphuric acid upon ordinary alcohol. Very inflammable.

Action: Anesthetic, Cardiac and Respiratory Stimulant.

Locally anesthetic and a fat solvent. Is irritating in mouth and stomach. Stimulates heart and cir-

culation, also secretions. Stimulates quickly by hypodermic or mouth. Stimulates the heart by irritating. Is absorbed faster than alcohol, hence the four stages are quicker. Irritates nose, larynx and trachea, increasing secretions. Benumbs the nervous system. Chief use is for surgical anesthesia. Four stages: 1. Excitement and stimulation. 2. Narcosis. 3. Insensibility. 4. Recovery. Excreted by the kidneys and lungs.

Recovery from Surgical Anesthesia :

Natural reaction, with poor circulation and possible chills, makes it necessary to keep the patient warm and out of drafts. The excretion of the ether by the lungs requires plenty of fresh air. Increased secretions from the throat and mouth must be sponged out. To prevent the inhalation of vomitus with the possible nausea, the head must be kept low and to one side. Patient must be watched for surgical shock and collapse.

Nitrous Ether. Mild Diaphoretic and Diuretic. Carminative and Stimulant, dose, m.x to dr.ii

Hoffman's Anodyne (Compound Spirit of Ether). . Same action, dose, m.x to dr.ii

Chloroform

Source : A volatile liquid formed by the action of chlorinated lime on methyl alcohol.

Action : In addition to the effects of ether, chloroform has a distinct depressing action on the heart and nervous system. There is danger of complete

cardiac failure. It is less irritating to the kidneys and to air passages, non-inflammable, more agreeable, more prompt in action and produces less vomiting than ether, but is much more dangerous and has more serious after effects.

Chloroform is also used locally in liniments as a rubefacient and anodyne and to relieve itching.

III. Narcotics, Continued

b. The Opium Group.

Opium. (Morphin, Laudanum, Paregoric, Codein and Heroin.)

Source: The juice of the unripe Poppy seed.

Action: Analgesic, Hypnotic, Myotic, Secretory Depressant and in medicinal doses a Cardiac Stimulant. Externally and locally, slightly benumbing. Bitter taste and narcotic odor. Decreases appetite and digestion slightly. Causes nausea and vomiting. Constipating effect upon the intestines. Paralyzes peristalsis. Slight effect on circulation. Dilates vessels of skin and increases perspiration. Slight effect upon lungs, except through nervous system. The respiratory tract in the medulla is blunted, and respirations become deep and infrequent, and are liable to be destroyed entirely. Moral and intellectual senses are blunted, also sensory centers, especially for unpleasant impressions. Slows and steadies heart under certain conditions. Excreted through intestines. Will affect a nursing child through the mother's milk.

Preparation and Dosage :

Opium, dose, gr. $\frac{1}{4}$ to ii

Laudanum (Tincture of Opium), dose, m.v to xv
(10% Opium, m.x equals gr.i Opium, or gr. $\frac{1}{8}$ Morphin)

Paregoric (Camphorated Tincture of Opium), dose,
dr.i to oz. i (oz. $\frac{1}{2}$ equals gr.i)

Majendi's Solution of Morphin, dose, m.v to x
(m.xxx equals gr.i of Morphin)

Morphin Sulphate, dose, gr. $\frac{1}{10}$ to $\frac{1}{2}$

Codein Sulphate, dose, gr. $\frac{1}{4}$ to ii

Heroin, dose, gr. $\frac{1}{24}$ to $\frac{1}{12}$

Dover's Powder contains gr.i Opium, gr.i Ipecac,
and gr. viii Sugar of Milk

Tincture of Deodorized Opium (10%), (m.x = gr.i),
dose, m.v to m.xxv

Symptoms of Overdosage :

Morphin, gr. $\frac{1}{2}$, and Opium, gr.iii, may produce death. Contracted pupils, drowsiness, deepening stupor, no response to external stimuli, skin moist and clammy, becoming cyanotic. Respirations slow, rate 4 to 6 per minute. Feeble pulse. Coma, pin-point pupils. Death from failure of respirations in 4 to 12 hours.

Treatment :

Evacuate stomach by tube, if possible. Emetics. Destroy, or neutralize, the poison with Pot. Permanganate or Tannic Acid (with Morphin, the latter forms Morphin Tannate, which is insoluble). Keep awake. Tone respiratory centers with Strychnin, Caffein and Atropin.

Apomorphin (a derivative of Morphin)

Dose, gr. $\frac{1}{10}$ (hypo) Emetic

Dose, gr. $\frac{1}{80}$ Expectorant

III. Narcotics, Continued

c. Hypnotics.

Chloral Hydrate

Source: A chemical preparation formed by the action of Chlorine on Alcohol.

Action: Powerful Hypnotic, Antispasmodic and Nervous Depressant. Irritates mouth and stomach. (Should therefore be well diluted.) Depresses heart and circulation. Benumbs nervous system, causing sleep. Sometimes causes headache, excitement and even delirium. Danger of sudden collapse of heart. Dose, gr.v to xx.

Symptoms of Overdosage:

Profound sleep. Coma. Slow, feeble, irregular pulse. Slow, shallow respiration. Cold skin. Cyanosis.

Antidotes and Treatment:

Emetic and lavage. Coffee enemata. External heat. Possibly artificial respiration. Cardiac stimulants.

Chloralamid. Hypnotic without after effects. Dose, gr. x to xxx.

Amylene Hydrate. More agreeable and safer than Chloral or Paraldehyd. No influence on

heart or respiration. No unpleasant after effects. Dose, dr. $\frac{1}{2}$ to iss.

Hedonal. Feeble Hypnotic. Considered safer than most other agents of the class. No unpleasant after effects. Dose, gr. xv to xxx.

Paraldehyd. Hypnotic and Diuretic, with little depression. Readily absorbed by rectum. Safer than Chloral, strengthening and slowing heart's action. Sound, refreshing sleep follows a preliminary stage of excitement. Dose, dr. $\frac{1}{2}$ to ii.

Sulphonal. Hypnotic of slow absorption, with unfortunate after effects. Should be given in hot solutions. Dose, gr. x to xxx.

Trional. More soluble than Sulphonal. Should be given in hot milk for best results. Especially effective with Codein. Dose, gr. x to xxx.

Veronal. Same action as Trional, only more rapid. Produces a practically normal sleep, and is free from after effects. Dose, gr. viii to x.

IV. Respiratory Stimulants

Atropin: An alkaloid of Belladonna

Source: The Belladonna plant, or Deadly Nightshade.

Action: Analgesic, Antispasmodic, Cardiac and Respiratory Stimulant, Cerebral Excitant, Secretory Depressant, Mydriatic. In small doses a vasoconstrictor, in large doses vasodilator. Most important

actions: 1. Respiratory stimulant. 2. To relieve spasms of involuntary muscles, as from stones in gall-bladder, cathartic gripes, etc. 3. To dry secretions of stomach, nose, sweat glands, etc. Externally and locally freely absorbed, with benumbing effects. (Belladonna plaster, ointment and liniment.) Bitter taste; dries the secretions of stomach. Checks excessive spasms of stomach and intestines. Stimulates nervous system and brain, sometimes causing delirium. Dries the secretion of all secreting glands. Stimulates and tones whole system. Peculiar effect on the brain, causing excitability and possibly narcosis. Causes dryness of throat. Is a cardiac stimulant. Eliminated by the kidneys. Locally benumbs pain. Dilates pupils by paralysis of constrictor fibers.

Preparation and Dosage:

Tincture of Belladonna, dose, m.v to x

Fluid Extract of Belladonna, dose, m.i to ii

Atropin, dose, gr. $\frac{1}{150}$ to $\frac{1}{50}$

Extract of Belladonna, dose, gr. $\frac{1}{4}$ to $\frac{1}{2}$

Symptoms of Overdosage:

Rash. Pupils bright and staring. Dry, flushed skin. Dry throat, with difficulty in swallowing. Headaches, illusions and delirium. Rapid pulse, out of proportion to respirations. Symptoms like those of Scarlet Fever, except for the dilated pupils.

Antidotes and Treatment:

Evacuate stomach and treat symptoms. Catheterize. Apply external heat. Artificial respiration.

Give Tannic Acid. Pilocarpin, Morphin and Eserin.

Stramonium

Source : The Jamestown Weed or Thorn Apple.

Action : Antispasmodic and Anodyne. Action similar to that of Belladonna. Causes cardiac irregularity and delirium. Relaxes muscles of bronchial tubes more powerfully than Belladonna. Contains the alkaloids, Atropin and Hyoscyamin, also some Hyoscin. The smoke inhaled brings Atropin into contact with the bronchial mucous membrane. Relaxes spasms in Asthma.

Leaves prepared in the form of cigarettes.

Fluid Extract, dose, m.i to v

Tincture, dose, m.v to xv

Hyoscyamus

Source : Henbane.

Action : Same physiological action as Belladonna. Cardiac and Respiratory Stimulant. Greater Sedative and Hypnotic (due to Hyoscin). Dries the mouth. Flushes face. Dilates pupils and causes delirium. Used as a sedative in bladder troubles.

Preparation and Dosage :

Fluid Extract, dose, m.i to v

Tincture, dose, m.v to xxx

Hyoscin

Source : The alkaloid obtained from Hyoscyamus. The active principles have the same chemical formula as Atropin, yet are not identical.

Action : Powerful Hypnotic and Spinal and Cerebral Sedative.

Reduces pulse rate and depresses circulation after first stimulating them. Is deadly and very depressing. Used in insanities, delirium and mania.

Preparation and Dosage :

Hyoscin Hydrobromid, dose, gr. $\frac{1}{100}$ to $\frac{1}{50}$

V. Motor and Respiratory Depressants

Eserin. An alkaloid from Physostigma.

Source : A West African plant (the Calabar Bean).

Action : Depresses spinal motor centers and respiratory centers of the medulla. Stimulates secretions, excites nausea, salivation and diaphoresis. Stimulates muscle fibers, especially those of the intestines, stomach and bronchial tubes. Raises blood pressure. Death may occur from paralysis of respiratory centers. Used in constipation, due to torpor of the bowels, and in Tetanus and Strychnin poisoning to diminish reflex excitability. A myotic used in eye troubles. Prevents suppuration after operations. Empties vessels of eye and contracts pupil.

Preparation and Dosage :

Eserin Salicylate, dose, gr. $\frac{1}{100}$ to $\frac{1}{30}$

Eserin Sulphate, dose, gr. $\frac{1}{100}$ to $\frac{1}{30}$

Extract of Physostigma, dose, gr. $\frac{1}{12}$ to $\frac{1}{2}$

Tincture of Physostigma, dose, m.v to xx

Symptoms and Treatment of Overdosage :

Muscular weakness, tremor, small pupils, slow pulse and respiration.

Emetics. Tannic Acid, Atropin, stimulants and artificial respiration.

Bromids. Average dose, usually gr.x to xv.

Source : Bromin, a non-metallic element found in sea water and in the product of certain salt works.

Action : Powerful Depressants to nervous system and circulation. Hypnotic and sedative.

VI. The Coal-Tar Products

- { *a.* Antipyretics
- { *b.* Antiseptics

Source : Prepared by complicated chemical processes from the tar which is formed in the manufacture of illuminating gas from coal.

Action : Externally and locally all are antiseptics and irritants. To the stomach they are irritants. Upon the pain centers of the nervous system they have a blunting influence.

a. Antipyretics. Circulation is at first stimulated, later depressed. Vessels of skin are dilated, and there is sweating and heat loss. Transitory stimulation of heart, followed by depression.

Acetanilid, dose, gr.i to iv. (Death has occurred from gr.v.)

Antipyretic and Analgesic and a Cardiac Depressant. (Acetanilid is the chief constituent of many "headache powders," making them very dangerous.)

Ammonol, dose, gr.v to x.

A proprietary Analgesic and Antipyretic, with stimulant and expectorant qualities.

Antikamnia, dose, gr.v to xv.

A proprietary Antipyretic and Analgesic, said to contain Acetanilid, Sodium Bicarbonate and Caffein.

Antipyrin, dose, gr.i to x.

Powerful Antipyretic and general Analgesic. Somewhat hypnotic, diaphoretic and antiseptic.

Migranin, dose, gr.v to xv.

A combination of Antipyrin and Caffein. Powerful Analgesic, used chiefly for sick headache and neuralgia. Dangerously depressant.

Aspirin, dose, gr.v to xv t. i. d.

A salicylic product. More efficient than the salicylates and less irritating to the stomach.

Phenacetin (Acetphenetidin), dose, gr.v to x.

Antipyretic; Hypnotic and Analgesic. Acts more gradually than the other antipyretics. One of the safest and most efficient of the group.

VI. The Coal-Tar Products, Continued

b. Antiseptics

Have, in general, the same effect as antipyretics, only do not reduce temperature and are more poisonous.

Benzoin

Antiseptic, Analgesic, somewhat Antipyretic, Diaphoretic, Diuretic and Stimulating Expectorant.

Creosote

Antiseptic, Expectorant and Astringent. Used especially for its antiseptic action on pneumococci and tubercle bacilli. Combined with an insoluble salt (Creosote Carbonate, gr.xv) it is less irritating to the stomach.

Guiacol, dose, m.v to xv.

Chief constituent of Creosote. Antiseptic in tuberculosis. Powerful local anesthetic, and rapid antipyretic when applied externally.

Carbolic Acid (Phenol)

Antiseptic and Disinfectant. Local anesthetic, also a cardiac respiratory and nervous depressant. Powerful irritant and caustic. Readily absorbed, and when poisoning is due to absorption an early symptom is a smoky appearance of the urine.

Symptoms of Poisoning: Collapse, cold, clammy skin, contracted pupils, feeble, shallow respirations, dark green urine, stupor and coma.

Antidote: Externally, Alcohol; internally, Alcohol and water, equal parts.

Picric Acid

Externally, Antiseptic, Analgesic and non-irritant to the tissues. Used as local application for burns and Erysipelas.

Creolin and Lysol

Unofficial Antiseptics and Disinfectants.

Phenol-camphor (Carbolic Acid, 1 part ; Camphor, 2 parts)

Local Anesthetic and Antiseptic.

Salicylic Acid

Generally prepared from Phenol, but also derived from Salicin or the natural salicylates, Oil of Wintergreen (Gaultheria) or Sweet Birch. (Methyl-Salicylate or artificial Oil of Wintergreen is a volatile preparation.)

Antiseptic, Antipyretic and Germicide. Stimulates and disinfects kidneys and has diaphoretic power. Cholagogue and intestinal antiseptic. Overdosage produces buzzing and roaring in the ears, disturbance of vision, excessive sweating, delirium, cardiac and respiratory depression.

Sodium Salicylates (less irritating to the stomach) deaden pain perceptions in rheumatism. Dose, gr.v to xxx.

Salol. Intestinal Antiseptic formed by the action of Carbolic Acid on Salicylic Acid. Dose, gr.i to x.

VII. Diuretics and Diaphoretics

Scoparius (Spartein Sulphate). From the Broom Plant.

Diuretic and Laxative, also Emetic, Cathartic and Cardiac Stimulant.

Spartein Sulphate, dose, gr. $\frac{1}{18}$ to ii.

Fluid Extract of Scoparius, dose, m.x to dr.i.

Squill (Scilla)

Powerful Diuretic and Expectorant. Gastrointestinal Irritant and Cardiac Stimulant. (Acts like Digitalis.)

Fluid Extract of Squill, dose, m.i to v.

Tincture of Squill, dose, m.v to xxx.

Syrup of Squill, dose, dr. $\frac{1}{2}$ to i.

Pilocarpin (Jaborandi)

Stimulates all the secretions but the bile. Depresses the heart.

Dose, gr. $\frac{1}{8}$ to $\frac{1}{8}$. Hydrochlorid.

Apocynum (Canadian Hemp)

Diuretic, Emetic and Alterative.

Fluid Extract, dose, m.ii to xx.

Senega. Diuretic and Diaphoretic and Stimulating Expectorant.

Fluid Extract, dose, m.x to xxx.

Syrup, dose, dr.i to ii.

Potassium Acetate, dose, gr.xxx.

Potassium Citrate, dose, gr.xxx.

Rochelle Salt (Potassium and Sodium Tartrate), dose, dr.i to ii.

Seidlitz Powder (Compound Effervescing Powder)

A. B. C. Diuretic (Potassium Acetate, Bicarbonate and Citrate), dose, oz. $\frac{1}{2}$.

Diuretin, dose, gr.x to xv

VIII. Cathartics

a. Laxatives (hasten intestinal evacuation). (Aperients.)

Olive Oil.

Castor Oil (Oleum Ricini), dose, oz. $\frac{1}{2}$.

Glycerin, dose, dr.i to ii.

Magnesia.

Figs, Prunes and stewed fruit.

b. Simple Purgatives (produce active peristalsis and griping pain).

Aloes (Aloës, Belladonna and Strychnin Pills).

Castor Oil.

Rhubarb (Mixture of Rhubarb and Soda, dose, dr.i to iv).

Licorice Powder (Compound, dose, dr.i to ii).

Cascara (Fld. Ext., dose, m.x to xxx).

Senna (Fld. Ext., dose, m.x to dr.i).

c. Drastic Purgatives (produce intense action, watery stools and much pain).

Croton Oil, dose, m.i to iii (Oleum Tiglii).

Jalap (Compound, dose, gr.x to xxx).

Aloes.

C. C. Pills (Compound Cathartic)

Podophyllum (Fld. Ext., dose, m.i to xx).

d. Cholagogue Purgatives (remove bile from the intestines).

Calomel (Mild Mercurous Chlorid, dose, gr.i to iii).

Blue Mass, dose, gr.iv.

Gray powder.

Podophyllum. Elaterin, dose, gr. $\frac{1}{20}$ to $\frac{1}{12}$.

e. Saline Purgatives (produce slight pain and watery evacuations.)

Salts of Magnesia.

Salts of Sodium.

Salts of Potassium.

Saline Waters.

IX. Alteratives

Arsenic

Source: A metal that occurs in combination with many minerals.

Action: Tonic, Antiseptic, Antiperiodic and Hematic. Internally a stomachic and general tonic. Increases cardiac action and respiratory power and intestinal secretions. Stimulates peristalsis and exalts mental activity. A tolerance to large doses can be acquired. Used also in depilatories. Produces a fair skin. Quickly absorbed. Eliminated by skin and kidneys chiefly. Often used in neuralgia, chronic malaria, anemia, rheumatism and chorea. Increases number of red blood corpuscles.

Preparation and Dosage:

Fowler's Solution (Sol. of Potassium Arsenite, a 1% sol.), dose, m.ii to vi t. i. d.

Arsenous Trioxid (White Arsenic), most frequently used as a poison. Tasteless, cheap and easily procured.

Symptoms of Overdosage:

Itching and edema of eyelids, nausea and diarrhea. Skin eruptions, irritable heart, dyspnoea. In large

doses a powerful irritant to gastrointestinal and broncho-mucous membranes. Pain in throat and abdomen. Bloody stools. Collapse. (Symptoms resembling those of Cholera.)

Treatment:

Lavage and emetics. Mucilaginous or albuminous drinks. Raw egg in milk and lime water. Equal parts oil and lime water. Castor Oil. Opium and stimulants. ~~Counteract depression.~~

Iron (Ferrum)

General Tonic and Stomachic. Enriches blood corpuscles with hemoglobin. Promotes appetite and digestion. Astringent and hemostatic (on account of its power to coagulate albumin).

Preparation and Dosage:

Tincture of Ferric Chloride, dose, m.v to xv.

Basham's Mixture (Sol. of Iron and Ammonium Acetate), dose, dr.ii to vi.

Triple Phosphates (Iron, Quinin and Strychnin), dose, dr.i.

Syrup of Ferrous Iodid, dose, m.v to xl.

Blaud's Pills.

Iodin (I)

A non-metallic element found in seaweeds, some fresh-water plants, also in sponge, oysters, eggs, rock salt and several ores. Tonic and alterative, increases elimination and body-weight. Improves general condition. May cause coryza and gastrointestinal irritation. Used in specific diseases.

Potassium Iodid, dose, gr.v to xx.

Counteracts pathological conditions, promotes absorption of morbid conditions and the elimination of several metallic poisons.

Iodoform. Antiseptic, Anesthetic and Alterative agent.

Aristol (Thymol Iodid). A substitute for Iodoform.

Hydriodic Acid. A substitute for the Iodids. Alterative in action. Dose, m.v to xv (dilute).

Calcium Chlorid, dose, gr.iii to x.

Marked alterative. Increases amount of urine and promotes the excretion of urea. Increases coagulability of blood.

Urotropin (from Formaldehyd)

Urinary and Intestinal Antiseptic. Promotes excretion of uric acid. Efficient as alterative and diuretic in cystitis. Decomposes in the organism, setting free Formaldehyd.

Sodium Phosphate, dose, gr.xx to dr.ii.

Alterative. Increases secretions, especially bile. Cholagogue. Promotes the nutrition of bony and nervous tissue.

X. Metals. (Symbols and Latin names in parentheses.)

Alum (Aluminum, Al).

Astringent, Emetic and Antiseptic.

Dried Alum, Aluminum Sulphate (Aluminum Acetate Sol.).

Antimony (Antimonium, Sb).

Irritant and Emetic.

Tartar Emetic (Antimony and Potassium Tartrate),
dose, gr. $\frac{1}{12}$ to ii.

Arsenic (Arsenum, As).

Tonic and Stomachic and Alterative.

Arsenous Acid, Fowler's Solution.

Bismuth (Bismuthum, B).

Astringent and Sedative.

Bismuth Subnitrate, Bismuth Subgallate, etc., dose,
gr.v to xx.

Cerium (Ce).

Gastric Sedative.

Cerium Oxalate, dose, gr.i to viii.

Copper (Cuprum, Cu).

Caustic, Stimulant and Astringent.

Copper Sulphate (Bluestone), dose, gr.vi to xii
(Emetic).

Gold (Aurum, Au).

Tonic and Alterative.

Gold Chlorid, etc.

Iron (Ferrum, Fe).

Tonic, Stomachic, Astringent, Hemostatic and
Hematinic.

Basham's Mixture, Blaud's Pills, Syrup of Ferrous
Iodid, etc.

Lead (Plumbum, Pl).

Astringent, Sedative, Hemostatic.

Lead Acetate, dose, gr.ii to v, Lead and Opium
Solution.

Manganese (Manganum, Mn).

Irritant, Caustic, Antiseptic, Disinfectant and Deodorant.

Potassium Permanganate.

Mercury (Hydrargyrum, H), Quicksilver.

Antiseptic and Disinfectant, Astringent, Purgative and Alterative. Specific for Syphilis.

Bichlorid of Mercury (Corrosive Sublimate), fatal dose, gr.iii to v.

Calomel, Blue Mass, Blue Ointment, Yellow Oxid of Mercury.

Silver (Argentum, Ag).

Caustic, Astringent, Antispasmodic, Nerve Stimulant.

Silver Nitrate.

Zinc (Zincum, Zn).

Caustic, Astringent and Emetic.

Zinc Oxid, Zinc Ointment, Zinc Sulphate, dose, gr.xv to xx (Emetic).

XI. Intestinal Antiseptics

Salol, dose, gr.i to x.

Sodium Salicylates, dose, gr.v to xxx.

Creosote Carbonate, dose, m.v to dr.i.

Urotropin, dose, gr.v. to vii.

XII. Intestinal Astringents

Bismuth Subnitrate, dose, gr.v to xx.

Bismuth Subgallate, dose, gr.v to xx.

Powdered Opium, dose, gr. $\frac{1}{4}$ to ii.

Preparations of Iron.

Tannic Acid, dose, gr.i to v.

Silver Nitrate.

Alum, dose, gr.v to xxx.

XIII. Antispasmodics

Asafetida

A powerful Antispasmodic, Nerve Stimulant and Expectorant. Also tonic, laxative, diuretic and diaphoretic. Nauseous in taste and odor. Used in hysterias, flatulent indigestion and bronchial affections.

Tincture of Asafetida, dose, m.x to xxx.

Emulsion of Asafetida, dose, dr.ii to iv.

Valerian

Antispasmodic and gentle stimulant to nervous and circulatory systems. Laxative and diaphoretic. Used in hysterias, for nervous coughs, etc.

Tincture of Valerian, dose, dr.i.

Fluid Extract of Valerian, dose, m.xxx.

Belladonna

Opium

Chloral

Stramonium, etc.

XIV. Acids

Acetic. Astringent, Hemostatic, Caustic, Diuretic and Antiseptic.

Glacial Acetic. Strongly caustic and only used locally.

Dilute Acetic (6%), dose, m.xv to dr.ii.

Vinegar (Acetum) is an impure dilute acetic acid.

Hydrochloric (Muriatic Acid)

Caustic and Stomachic. Checks fermentation.

Dilute Hydrochloric, dose, m.iii to xx. (10%)

Hydrocyanic (Prussic Acid)

One of the most powerful and rapid poisons known.

Death has resulted from smelling it.

Dilute Hydrocyanic is used for its antispasmodic and sedative effects. Contains 2% of absolute Hydrocyanic Acid and is the only official form.

Dose, m.i to ii.

Nitric. Caustic and Cholagogue

Nitrohydrochloric Acid. Efficient Cholagogue.

Dose, m.i to viii.

Sulphuric. Astringent, Hemostatic and Caustic.

Dilute Sulphuric, dose, m.v to xx.

Tannic. Powerful Astringent, dose, gr.i to xx.

ANTIDOTES AND TREATMENT FOR POISONING BY

Acetanilid. Symptoms: Collapse, cyanosis, slow respiration, feeble, irregular pulse, vomiting, profuse sweating.

Treatment: Belladonna or Atropin, Strychnin, oxygen inhalations, heat.

Acid, Acetic. Symptoms: Gastrointestinal irritation and collapse.

Treatment: Magnesia, soap and water, lime water, chalk, milk, oils and thick gruel.

Acid, Carbolic. Symptoms: Collapse. Cold, clammy skin. Burning from mouth to stomach. Smoky or dark green urine. Slow respirations.

Treatment: Lavage with Alcohol and water, equal parts. Epsom Salts, soap suds, heat to extremities with friction, Atropin and alcoholic stimulants. Lavage with Pot. Permanganate, gr. $1\frac{1}{4}$ to 1 pt., or Condyl's Fluid, dr.ii to 1 pt.

Acid, Hydrocyanic (Prussic). Symptoms: Coma, dilated pupils, cold, clammy skin, slow, convulsive respirations, small, feeble pulse. Death from respiratory failure in a few seconds after large dose.

Treatment: Emetics or lavage, artificial respiration with Ammonia inhalations, Atropin, Brandy, Ether.

Acid, Oxalic. Symptoms: Gastrointestinal irritation, convulsions, collapse. Death from paralysis of respirations.

Treatment: Lime water, chalk, whiting, wall-plaster in water, Magnesia, mucilaginous drinks.

Acids, Mineral (Hydrochloric, Nitric, Sulphuric, etc.)

Symptoms: Gastrointestinal irritation and collapse, pain.

Treatment: Alkalies, as Magnesia, chalk, soap, whiting, wall-plaster in water, albumen, flour, milk, starch, olive oil. Avoid water in Sulphuric Acid cases. Opium, Alcohol and other cardiac stimulants.

Aconite, see page 31.

Alcohol. Treatment: Emetics or lavage, cold affusion to the head, warmth to extremities, artificial respiration, Caffein, Chloral and Pot. Bromid.

Alkalies. Symptoms: Corrosion, gastrointestinal irritation.

Treatment: Diluted vegetable acids, as vinegar, lemon juice, etc. Milk, gelatin, oils, Caffein, Alcohol and other stimulants.

Ammonia, see **Alkalies**.

Amyl Nitrite, see page 29.

Anesthetics (Ether, Chloroform, etc.)

Treatment: Oxygen, artificial respiration, Atropin, Strychnin, Adrenalin, heat to the body and limbs. Invert patient, draw the tongue well forward, compress and relax chest.

Arsenic, see page 50.

Atropin and Belladonna, see page 40.

Chloral, see page 38.

Cocain. Symptoms of acute poisoning: Pallor, fainting, cardiac and respiratory depression.

Treatment: Cardiac stimulants, artificial stimulation.

Mercury (Bichlorid, etc., Corrosive Sublimate).

Acute symptoms: Gastrointestinal irritation with great pain, vomiting and diarrhea, collapse.

Treatment: Egg albumen (1 egg for each 4 grains of the poison), demulcents, milk. Later, saline diuretics and rectal irrigation.

Opium (Morphin, Laudanum, Paregoric, etc.), see page 37.

Phenacetin, see **Acetanilid**.

Digitalis, see page 26.

Formaldehyd. Ammonia is the antidote forming Urotropin.

Fish Poison (ptomaine). Emetics and cathartics. Potassium Chlorate, Opium, etc.

Illuminating Gas. Treatment: Oxygen, artificial respiration, Ammonia vapor, black coffee enema, horizontal position with clothing removed, catheterization, external heat, cold acid drinks.

Iodin. Symptoms: Gastrointestinal irritant, colored vomitus.

Treatment: Starch water with lavage, flour, gelatin, albumen.

Lead. Acute symptoms: Vomiting and colic, collapse.

Treatment: Emetics, lavage, Magnesium Sulphate, external heat and cardiac stimulants.

Nitroglycerin, see Amyl Nitrite.

Phosphorus. Acute symptoms: Vomiting and abdominal pain, collapse.

Treatment: Emetics and lavage (Potassium Permanganate 1 : 6000), saline purge.

Strychnin and Nux Vomica, see page 25.

Veratrum Viride, see page 32.

PART. IV

COMMON FORMULÆ

A. B. C. Diuretic (Mistura Diuretica)

A half-an-ounce dose contains

Potassium Acetate, gr.viiss

Potassium Bicarbonate, gr.viiss

Potassium Citrate, gr.viiss

Alum Acetate Liquor

Aluminum Sulphate, Glacial Acetic Acid, Calcium Carbonate and Distilled Water.

Anti-Alcoholic Mixture (Mistura Chloralis Composita)

A half-ounce dose contains

Chloral, gr.xv

Morphin Sulphate, gr. $\frac{1}{8}$

Tr. of Hyoscyamus, m.xxx

Ginger and Capsicum

Basham's Mixture

One drachm contains approximately

Tincture Ferric Chlorid, m.iiss

Dilute Acetic Acid, m.iiiss

Liquor Ammonium Acetate, m.xxx

Aromatic Elixir, m.vii

Glycerin, m.vii

Water, m.x

Dose, dr.ii+

Blaud's Pills

Iron Sulphate, gr. i.iss

Potassium Carbonate, gr. i.iss

Brown Mixture (Compound Glycyrrhiza Mixture)

One ounce contains

Extract of Licorice, gr. xv

Acacia, gr. xv

Paregoric, dr. i

Wine of Antimony, m. xxx

Spts. of Nitrous Ether, m. xv

Water and Syrup

Dose, dr. i to oz. i

Bronchitis Tablets (Delafield)

One tablet contains

Extract of Belladonna Leaf, gr. $\frac{1}{10}$

Dover's Powder, gr. $\frac{1}{10}$

Pulverized Ipecac, gr. $\frac{1}{20}$

Quinin Sulphate, gr. $\frac{1}{4}$

C. C. Pills (Compound Cathartic)

One pill contains

Extract of Colocynth (Compound), gr. $1\frac{1}{4}$

Calomel, gr. i

Resin of Jalap, gr. $\frac{1}{8}$

Powdered Gamboge, gr. $\frac{1}{4}$

Citrate of Magnesia

One bottle contains

Magnesium Carbonate, 160 grains

Citric Acid, 320 grains

Oil of Lemon, few drops

Sugar and Water, 12 ounces

Chloroform Liniment

Chloroform, Laudanum, or Camphor or Almond Oil.

Compound Licorice Powder

One drachm contains
Powdered Sugar, gr.xxx
Oil of Fennel, m. $\frac{1}{4}$
Washed Sulphur, gr.v
Powdered Senna, gr.xss
Powdered Licorice, gr.xiv
Dose, dr.ss to ii

Dobell's Solution

Sodium Borate (Borax), dr.ii
Sodium Bicarbonate, dr.ii
Glycerin, dr.iv
Carbolic Acid, m.xx
Distilled Water, q. s. ad oz.xvi

Imperial Drink (Haustus "Cremor Tartari")

Potassium Bitartrate, 160 grains
Spirit of Lemons, 15 minims
Syrup, $3\frac{1}{2}$ ounces
Water, q. s. ad 32 ounces

Red Wash

Zinc Sulphate, 10 grains
Tincture of Lavender, 2 drachms
Water, q. s. ad 4 ounces

Rhinitis Capsules

One capsule contains
Extract of Pulverized Belladonna, gr. $\frac{1}{8}$
Quinin Sulphate, gr.ii
Camphor, gr.ii

Rhubarb and Soda Mixture

One drachm contains
Sodium Bicarbonate, gr.ii
Fld. Ext. Rhubarb, m.ii
(Fld. Ext. Ipecac)
Glycerin, m.viii
Spirits of Peppermint, m.ii
Water, m.xlvi
Dose, dr.i+

Seidlitz Powders (Compound Effervescing Powder)

Sodium Bicarbonate, 45 grains and
Potassium-Sodium Tartrate (Rochelle Salt), 117
grains in each blue paper
Tartaric Acid, 34 grains in each white paper

Stokes' Expectorant

One drachm dose contains
Ammonium Carbonate, gr.i
Fld. Ext. Senega, m.ii
Fld. Ext. Squill, m.ii
Paregoric, m.xi
Syrup of Tolu
Water

Thiersch's Solution (Liquor Boro-Salicylicus)

Salicylic Acid, gr. xv
Boric Acid, gr.xc
Water, q. s. ad oz.xvi

**Triple Phosphates (Elixir Ferri, Phosphatis, Quininæ
et Strychninæ)**

One drachm dose contains about
Iron Phosphate, gr.ii

Potassium Citrate
 Quinin Hydrochlorate, gr.i
 Strychnin Sulphate, gr. $\frac{1}{100}$
 Alcohol
 Distilled Water
 Aromatic Elixir
 Dose, dr.i to ii

Warburg's Tincture

One drachm contains
 Purified Aloes, gr.ii
 Rhubarb, gr. $\frac{1}{2}$
 Angelica Root, gr. $\frac{1}{2}$
 Sweet Flag, gr. $\frac{1}{4}$
 Fennel, gr. $\frac{1}{4}$
 Gentian, gr. $\frac{1}{8}$
 Cubeb, gr. $\frac{1}{8}$
 Myrrh, gr. $\frac{1}{8}$
 Elecampane, gr. $\frac{1}{4}$
 White Boletus, gr. $\frac{1}{8}$
 Curcuma, gr. $\frac{1}{8}$
 Camphor, gr. $\frac{1}{8}$
 Quinin, gr. $1\frac{1}{4}$
 Alcohol, m.xxxv
 Water, m.xv

LATIN PHRASES AND ABBREVIATIONS

aa.	ana	of each
a. c.	ante cibum	before meals
ad	ad	to, up to
ad lib.	ad libitum	at pleasure

alb.	albus	white
alt.	alter	the other
alt. hor.	alternis horis	every other hour
alt. noc.	alterna nocte	every other night
aq.	aqua	water
aq. calc.	aqua calcis	lime water
aq. dest.	aqua destillata	distilled water
aq. pur.	aqua pura	pure water
b. i. d.	bis in die	twice a day
c.	cum	with
c. c.	centimeter cubicum	cubic centimeter
comp.	compositus	compound
dil.	dilutus	dilute
div. in p. æq.	dividatur in partes æquales	Let it be divided into equal parts
dr.	drachma	a drachm (60 grains)
et	et	and
ext.	extractum	extract
F.		Fahrenheit
fl.	fluidus	fluid
fol.	folia	leaves
garg.	gargarisma	a gargle
gm.	gramma	a gramme
gr.	granum	a grain
gtt.	gutta	a drop
h.	hora	hour
hor.	hora	hour
infus.	infusum	an infusion
inject.	injectio	an injection
K.	Kalium	Potassium

lac.	Lac, lactis	milk, of milk
lb.	libra	a pound
liq.	liquor	a solution
lot.	lotio	a lotion
M	Misce	mix
m.	minimum	a minim
min.	minimum	a minim
mist.	mistura	mixture
mol.	mollis	soft
nig.	niger	black
no.	numero	in number
noct.	nocte	at night
O.	octarius	a pint
ol.	oleum	an oil
o. h.	omni hora	every hour
o. m.	omni mane	every morning
o. n.	omni nocte	every night
os	os	the mouth
oz.	uncia	an ounce
p. r. n.	pro re nata	occasionally, as needed
p. c.	post cibum	after meals
per	per	through, by means of
per os		by mouth
per rectum		by rectum
pulv.	pulvis	powder
q. h.	quaqua hora	every hour
q. s.	quantum sufficit	as much as is sufficient
R.	recipe	take

rad.	radix	root
rub.	ruber	red
sem.	semen	seed
s. o. s.	si opus sit	if necessary
sp. gr.		specific gravity
s.	sine	without
ss.	semissis	a half
sol.	solutio	a solution
spt.	spiritus	a spirit
stat.	statim	immediately
s. f.	spiritus frumenti	whisky
s. v. r.	spiritus vini recti- ficatus	alcohol
s. v. g.	spiritus vini gallici	brandy
syr.	syrup	a syrup
t. i. d.	ter in die	thrice daily
tr.	tinctura	tincture
troch.	trochiscus	a lozenge
ung.	unguentum	an ointment
vin.	vinum	wine

PART V

ANTITOXINS, VACCINES AND SERA

Toxins are specific poisons produced by bacterial growth in suitable media, and when circulating in the organism they are the immediate causes of the acute infectious diseases.

Those constantly associated with certain infectious diseases are, notably, Tetanus, Diphtheria, Cholera, Pneumonia, Erysipelas and Typhoid.

Antitoxins are supposititious substances believed to be produced by the cells of the blood or tissue for the defense of the organism against foreign bacterial toxins.

Antitoxic Sera are composed of blood serum containing antitoxin produced therein by the cells of the organism as a result of the repeated injection of a toxin into the tissues of the animal from which the serum is taken.

An Antitoxic Unit is generally recognized as the quantity of an antitoxic serum which will counteract a definite amount of toxin in a guinea pig.

Bacterial Vaccines are suspensions of killed bacteria in sterile salt solution. Generally speaking vaccines are composed either of the bacteria themselves unchanged, except in so far as they are affected by the heat used in killing them, or by pulverization, or are some derivative of the bacterial cell. (Tuberculin, for instance, is a vaccine of the tubercle bacilli.)

The treatment of diseases due to pathogenic microbes, by the toxic products, is based upon the theory that these germs produce substances in their culture media which are hostile to their own life. (By culture media is meant substances used for cultivating bacteria.)

In 1891 the following law was formulated by Behring :

“The blood serum of an animal which has been artificially rendered immune against a certain infectious disease, when injected into the body of another animal, has power to protect the latter individual against the same disease and to cure the disease after infection has occurred.”

The fact of spontaneous recovery from infectious disease indicates that the body has the power to immunize itself against the bacteria and the bacterial products which are its cause. This faith in such immunizing ability is shown in the present method employed in the treatment of pulmonary tuberculosis, of placing the patient under the best conditions of hygiene and trusting for the cure to the inherent power of the body.

The only real success in securing protection against, and in the cure of diseases produced by microorganisms, is now known to be based upon the artificial direction of the body's own immunizing ability, by means of removing obstacles to its action, of furnishing the appropriate stimulus when such is lacking, or by the addition to the blood stream of specific substances which the body itself produces, but not in sufficient quantity to be effective in the production of a state of immunity against the infection under which it is struggling.

In protection against typhoid, for instance, the use of typhoid vaccine induces the protective mechanism to fortify the blood with elements that are calculated to destroy typhoid bacilli when they enter the body. Quite the same elements appear to be responsible for the recovery from the disease. A good example of success in following nature's lines of treatment in the cure of disease is that obtained in the treatment of diphtheria by antitoxin. Here we furnish, at a time when the body may be lacking in ability to neutralize the toxin of diphtheria, a substance, which is known to neutralize diphtheria poison and render it inert. The remarkable reduction in the mortality in diphtheria attests the efficacy of this measure. Not only has the mortality been reduced, but there has been an extraordinary decrease in the severity of symptoms. The prophylactic or immunizing dose in diphtheria is from 500 to 1000 units.

Immunity is freedom from risk of infection. There are two kinds, Active and Passive.

Active Immunity may be caused by recovery from a natural attack of an infectious disease, or it may be caused by the use of a vaccine which may be composed of living cultures of pathogenic bacteria of diminished or altered virulence, or of bacteria that have been killed by heat. An example of the use of a living vaccine is Vaccination. For this method is used a culture of the smallpox organism that has been modified by passage through calves (by inoculation). This modification is of such a nature that it has lost its power of producing the general disease, smallpox, but it has retained that

of causing a local disease, vaccinia, or cowpox, otherwise similar in nature. It appears here that through the stimulus which this mild disease furnishes, the cells of the body have derived an increased power to resist infection of smallpox. Here, then, has been made use of the body's own methods of protection against disease.

Another example of the production of active immunity by the use of a vaccine is the treatment for Rabies (Hydrophobia). The organism of this disease is unknown, but the virus occurs in the brain, and emulsions of this substance are used for inoculation. Rabbits are inoculated with this and their infected spinal cords are dried and used as a vaccine. This, in gradually increasing degrees of virulence, is given to patients, depending on the time in which the drying has gone on. (Drying removes the virulence after a time.)

Passive Immunity, or Antitoxic Immunity, is conferred in experimentation by injecting into a susceptible animal the serum of one which has acquired an active immunity to the disease in question. Active immunity takes some time, but passive immunity is established as soon as the serum has become mixed with the blood of the person or animal injected. Hence in severe infections our best hope is in the production of passive immunity. Passive immunity is of brief duration. In general terms the duration is three to six weeks.

All the Antitoxins cause passive immunity.

USES OF ANTITOXINS, VACCINES AND SERA

Antistaphylococic sera and vaccines have been prepared from virulent cultures derived from severe boils and carbuncles, and are sometimes used with benefit.

Antistreptococic sera and vaccines have been of great use in Erysipelas and other infections.

In Bacilli Coli infections (Cystitis, etc.) the vaccine treatment has met with remarkable success.

For Cholera, vaccines have been used with strikingly good results. The immunity afforded by the preventive inoculations lasts for a year. The value of the method has been proved to the full, particularly in India, where it has been used to a large extent.

Diphtheria antitoxin treatment has been demonstrated to be of the greatest value. The sole preventive treatment in actual use consists in the use of comparatively small doses of antitoxin. The protection which it confers is usually a strong one, but exceptions have been known. It lasts about a month. (See page 69.)

In Gonococcic infections vaccine treatment has been of the greatest possible value, and results are usually beneficial in the extreme.

In Meningococcic infections serum from convalescent cases of meningitis is sometimes used, and there have been excellent results in some instances.

Vaccines have been used in Pneumococcal Septicæmia with good results. In acute pneumonia vaccine treatment has been used in a very satisfactory manner, and the general condition of patients has improved. It

has been of especial value in unresolved consolidation, which often clears up after its use.

Plague Sera have been prepared and used in the treatment of the disease with very favorable results. It appears that no other treatment available has been so successful. The results from the preventive treatment have not been so successful, but of the value of the method there can be no doubt, and statistics prove clearly that the treatment (by a vaccine) lowers the likelihood of infection and also the case-mortality.

The treatment of Rabies or Hydrophobia by vaccines has shown remarkable results. There are several methods, but whatever the method the value of the process cannot be doubted. Active immunization appears necessary, because of the long period of incubation (one week to two months or longer) and the localization of the virus in the nerves. After the bite of a rabid animal the probability of the patient's developing the disease depends upon the severity of the bite, its position (that is, whether in regions rich in nerves or the reverse), and on whether the bite is through clothing, so that some of the virus is wiped from the teeth. (See page 70.)

Results of the experiments in the treatment and prevention of Syphilis by sera or vaccines have been unsuccessful as a rule.

Tetanus antitoxin is of great value as a prophylactic agent and it is of some value in chronic tetanus, that is, in the form with mild symptoms developing after a long period of incubation. Dose, 5 to 10 c. c.

Concerning a Tubercle antitoxin, nothing really

definite is known. The Tuberculin Reaction is chiefly used for rapid diagnosis of tuberculosis, and its main value is that it enables a negative diagnosis to be made with some degree of confidence, and is the only agent that will do so.

Tuberculin vaccines are sometimes used for combating the disease. Results have been favorable in conferring a certain amount of increased resistance.

In Typhoid Fever a natural attack will confer immunity, which probably has a duration of several years. Immunity due to preventive inoculation is thought to last six months at least. Curative treatment by serum or vaccines has not been satisfactory. The preventive treatment by the use of vaccines has been shown to confer a real though not absolute protection against an attack, and to be of still more value in diminishing the mortality rate among those attacked. (See page 69.)

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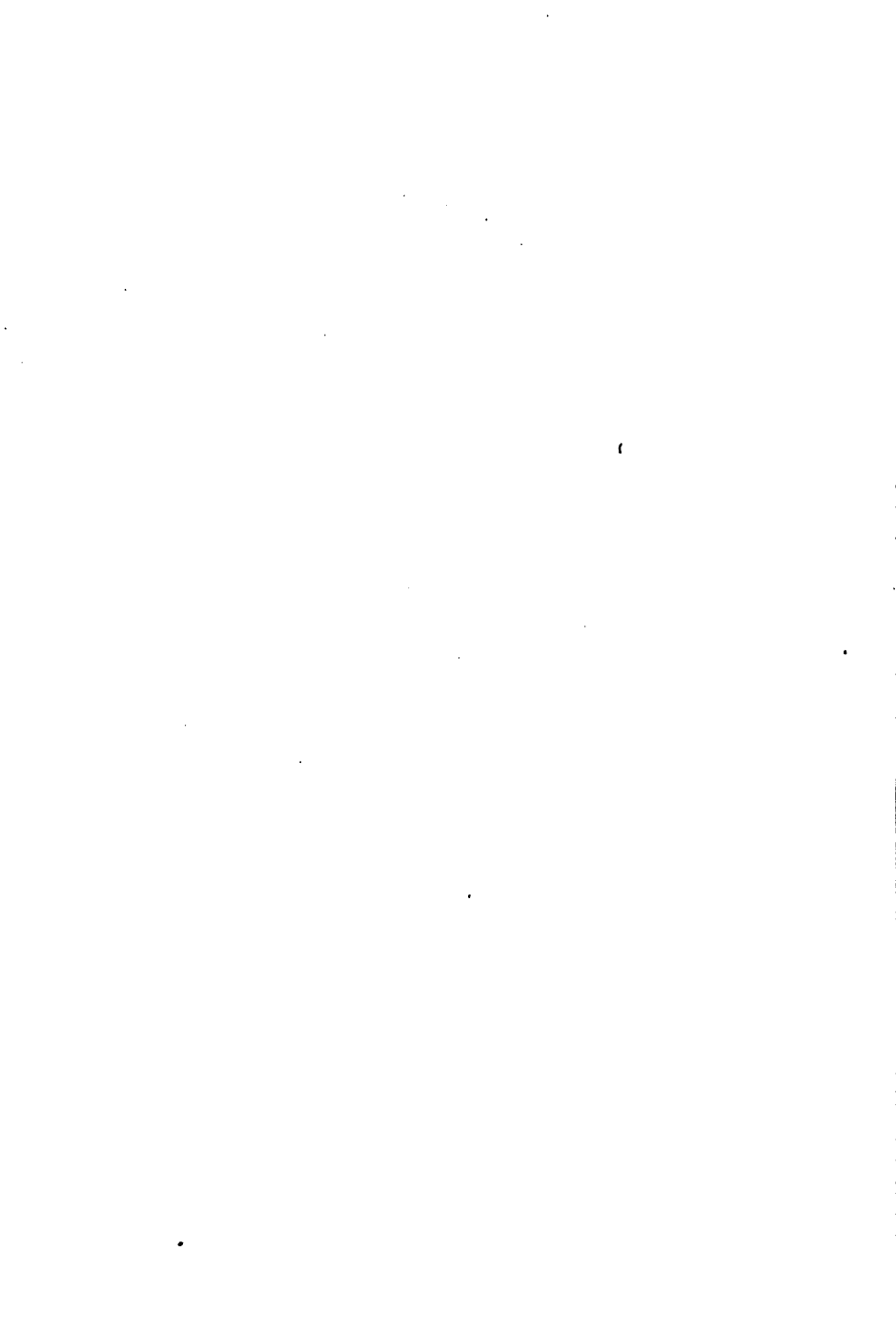
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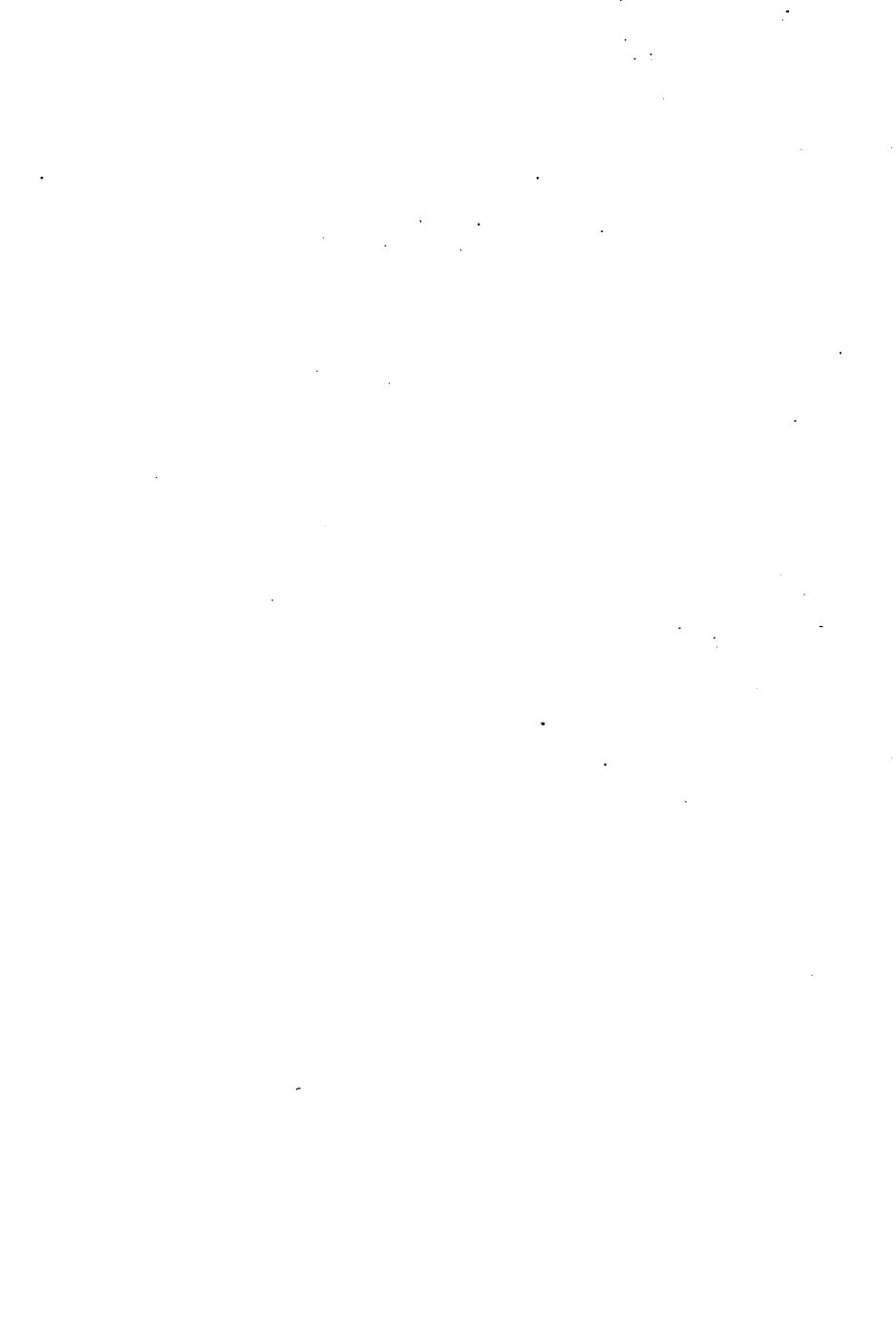
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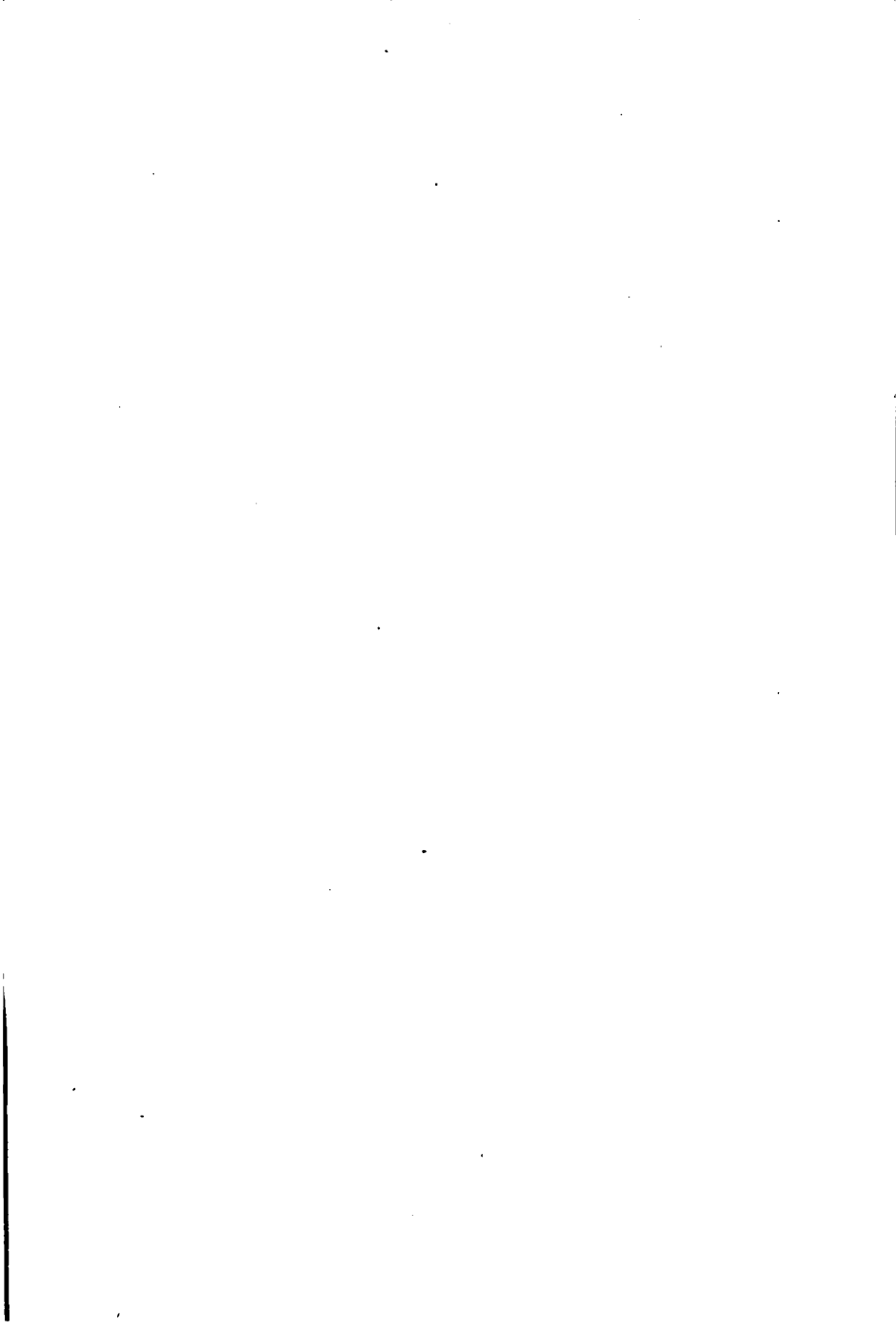














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